MAY 1955

chemical processing

For Men who Manage

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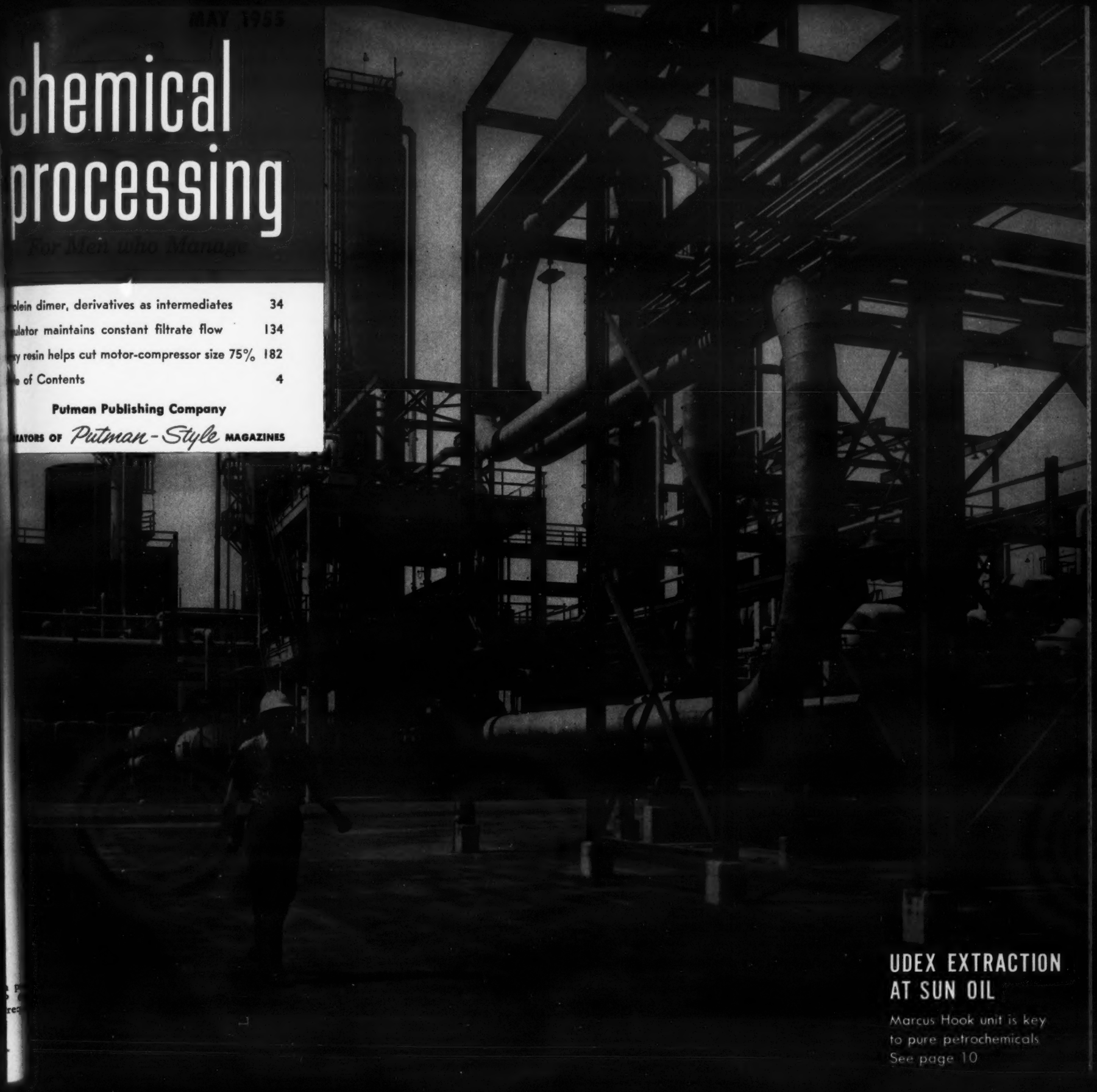
Putman Publishing Company

ATORS OF *Putman-Style* MAGAZINES

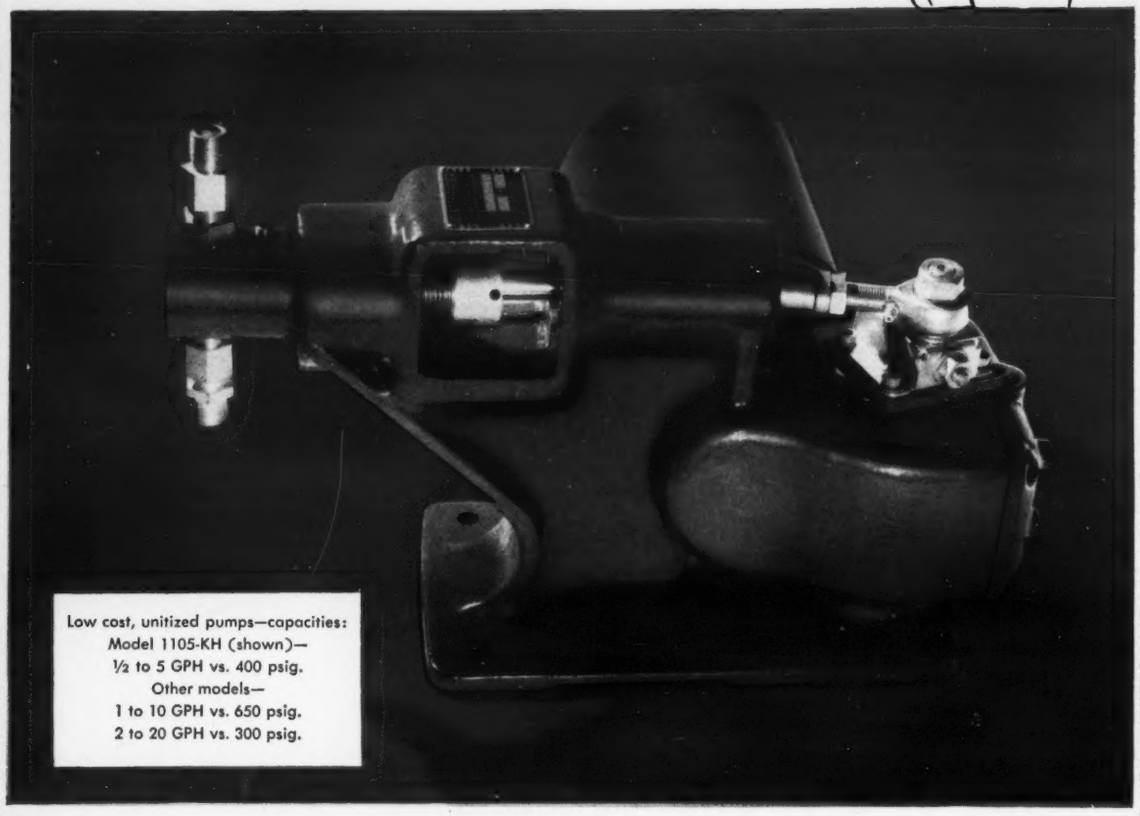


UDEX EXTRACTION AT SUN OIL

Marcus Hook unit is key to pure petrochemicals

See page 10

LET ME QUOTE!



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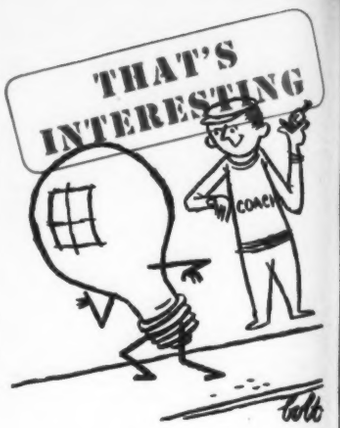

Light has speeded up

Two new determinations of the velocity of light have been made by National Bureau of Standards scientists. Both values — though arrived at through different methods — prove that light travels faster than previously thought. Before World War II, the concensus was that light loafed along at 299,776 km/sec (about 186,280 miles per second). Redetermination of this speed now has light rocketing along almost 660 mph faster!! (299,793 km/sec or about 186,291 mps).

Products personalized by poster program

Designed to overcome the impersonal nature of industrial products and increase quality consciousness is a poster program instituted by Minneapolis-Honeywell's Industrial Division. Cartoon-style posters located around plant point out how products made will ultimately regulate manufacture of products purchased by employes.

Posters are frequently changed. They are an answer to the cry that factory production squeezes craftsmanship out of the worker's life leaving it empty except for five o'clock and payday.

Human suggestion box

When a worker has an idea at Aldis Bros., Ltd., Birmingham, England, he doesn't jot it down and put it in a suggestion box. He explains it to an executive who helps him get his suggestion on paper. One executive is on "suggestion duty" two evenings a week.

(*Continued on page 223*)

For more information on product at left, specify CP 6650 . . . see information request blank opposite last page.

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 May, 1955 No. 5

Serving more than 35,000 circulation in these industries:

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W-8

When inquiring check CP 6651 opposite last page

Over the editor's shoulder

Words and Pictures

It's common knowledge that a good picture can take the place of many words . . . can pass on an idea quickly, often at a glance.

Most industrial magazines work on a modified form of this "word-picture" idea, using photos, diagrams, drawings, and similar illustrations to *supplement* written material . . . to clarify, but also to *dramatize*, the ideas being presented.

For example, our cover design was changed in December so that the full cover area can be used for an illustration. We can now "do justice" to leading examples of photography or art pertaining to the industry we serve.

On page 10 of this issue, you'll see what we call a "wide screen" effect for photo treatment. This is another example of how an industrial magazine can make good use of an illustration that captures the bigness of our industry — petrochemicals in this case. We are planning many other things to make CHEMICAL PROCESSING more attractive to the eye.

These art changes are made without impairing editorial content or readability, of course. In fact, most of them are planned as a direct help to quick, clear understanding of what is being said. Charts, diagrams and informative photos are important, for instance, and you'll see more and better ones.

But you'll also see artistic effects that will make each issue "look better". We believe that an industrial publication should be good-looking as well as informative.

Dana B. Berg

MANAGING EDITOR

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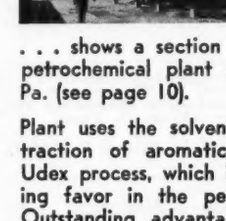

THIS MONTH'S COVER

. . . shows a section of Sun Oil's new petrochemical plant at Marcus Hook, Pa. (see page 10).

Plant uses the solvent method for extraction of aromatics, known as the Udex process, which is finding increasing favor in the petrochemical field. Outstanding advantage is the exceptional purity of the products, with high yield and low maintenance.

Association and Society addresses appear on page 213

May 7-15. Society of the Plastics Industry, Annual Meeting and Conference, Cruise on the Queen of Bermuda.

May 10. American Institute of Chemical Engineers, New Jersey Section, Sixth Annual Symposium, Hotel Essex, Newark, New Jersey.

May 12-13. Michigan State College, School of Engineering, Symposium on "Automation — Engineering for Tomorrow", East Lansing, Michigan.

May 15-17. Chemical Specialties Manufacturers Association, Mid-year Meeting, Drake Hotel, Chicago, Illinois.

May 16-20. National Materials Handling Exposition, International Amphitheatre, Chicago, Illinois.

May 16-21. Chemical Progress Week.

May 18-19. Chemical Market Research Association, Annual Meeting, Plaza Hotel, New York, N. Y.

May 22-26. Air Pollution Control Association, Annual Meeting, Detroit, Michigan.

May 23-27. American Society for Testing Materials, Third Annual Conference on Mass Spectrometry, Mark Hopkins Hotel, San Francisco, California.

May 26. Packaging Institute, Regional Meeting, Hotel Statler, St. Louis, Missouri.

June 6-8. American Pharmaceutical Manufacturers Association, Annual Convention, Greenbrier Hotel, White Sulphur Springs, West Virginia.

June 14-16. American Institute of Electrical Engineers, Basic Science Committee, First Magnetics Conference and Exhibit, William Penn Hotel, Pittsburgh, Pennsylvania.

June 26-*July* 1. American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 12-14. Western Plant Maintenance and Engineering Show, Pan Pacific Auditorium, Los Angeles, California.

September 12-16. Instrument Society of America, 10th Annual Instrument Conference and Exhibit, Shrine Exposition Hall and Auditorium, Los Angeles, California.

Note: Site for the 9th Annual Chemical Exposition (Nov. 27-30, 1956) has been changed from Chicago, host for all former expositions, to Cleveland.

- For more information, check the handy Reader Service slip opposite last page
- The product directory, pages 214 to 217, is your guide to all articles and advertisements
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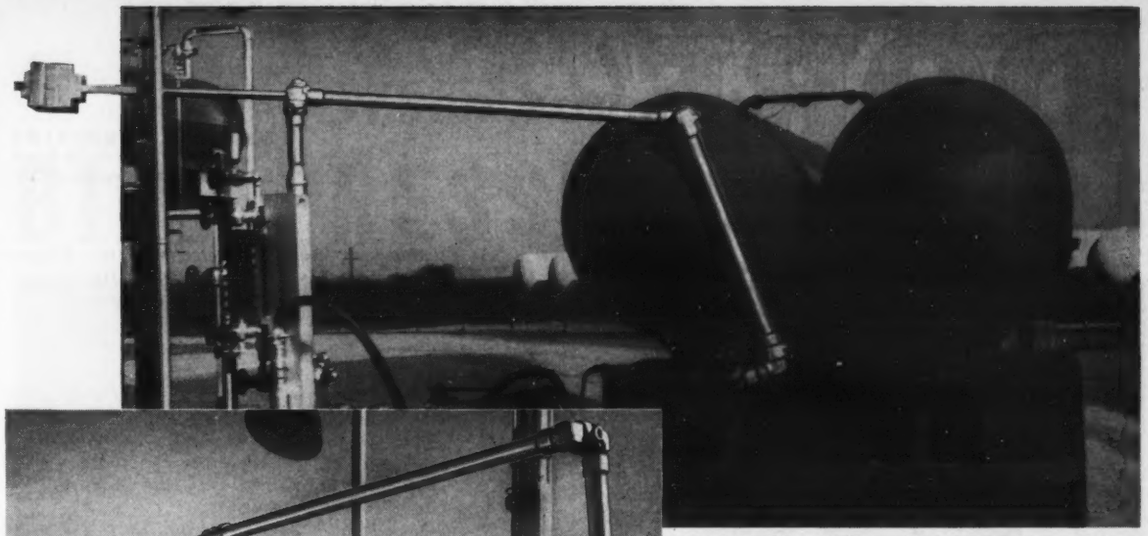
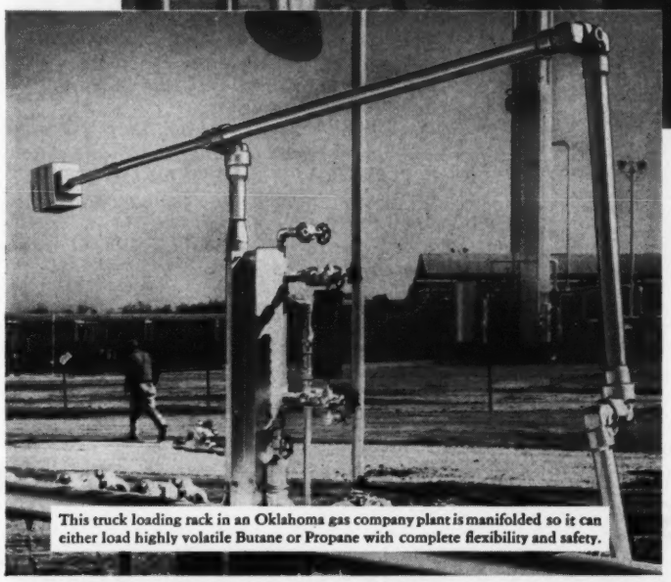


The truck loading rack illustrated here is made up of one 2", Style 50, one Style 40, one Style 50x5 high pressure steel Chiksan swivel joints, and one 1" Style 20 high pressure steel joint.



This truck loading rack in an Oklahoma gas company plant is manifolded so it can either load highly volatile Butane or Propane with complete flexibility and safety.

CHIKSAN adds Safety and Speed to Truck or Tank Car Loading of Gas or Chemicals

CHIKSAN provides the necessary liquid-tight, gas-tight connections, the characteristic flexibility of motion to keep volatile Butane and Propane or chemicals flowing swiftly with safety, economy and convenience.

Loading and unloading lines made up with dependable CHIKSAN ball-bearing swivel joints provide a wide margin of safety by using the same materials used throughout the pipe lines.

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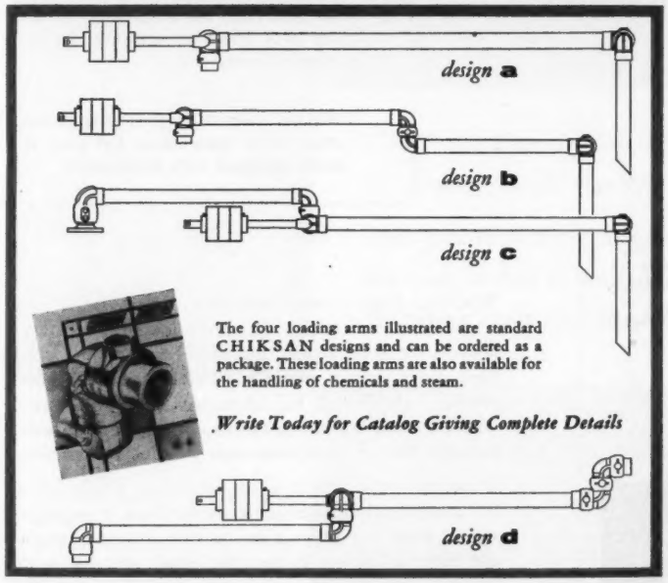
Write to Dept. CP-5 for Catalog giving complete detailed information.



The four loading arms illustrated are standard CHIKSAN designs and can be ordered as a package. These loading arms are also available for the handling of chemicals and steam.

Write Today for Catalog Giving Complete Details

The Flow of Enterprise Relies on
CHIKSAN
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TEFLON* BELLOWS AND TEFLON FLEXIBLE COUPLINGS

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Dore's quality control assures accurate dimensions, uniform density and wall thickness — rigid testing and inspection guarantees adherence to these controls.

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They are available with diameters 1" through 20", in lengths from 1½" to 60".

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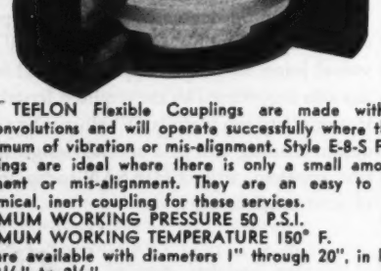

Dore's TEFLON Flexible Couplings are made with only two convolutions and will operate successfully where there is a minimum of vibration or mis-alignment. Style E-8-S Flexible Couplings are ideal where there is only a small amount of movement or mis-alignment. They are an easy to install, economical, inert coupling for these services.
MAXIMUM WORKING PRESSURE 50 P.S.I.
MAXIMUM WORKING TEMPERATURE 150° F.
They are available with diameters 1" through 20", in lengths from 1⅛" to 2½".
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OTTO EISENSCHIML
Chairman of the Board
Scientific Oil Compounding Co.

A Vienna-born American citizen, Otto Eisenschiml came to this country in 1901. He became chief chemist of the American Linseed Co. in 1904, and in 1912 established the Scientific Oil Compounding Co., of which he is now Chairman of the Board.
As Chairman of the Chicago Section of the American Chemical Society in 1914, he started the first sectional news magazine, the first employment and the first guidance committees, and arranged what probably was the first salary survey of American chemists.
Dr. Eisenschiml is widely known as a speaker, author, reviewer, and contributor to magazines. His book, "Without Fame", published in 1942, tried to arouse interest in chemists from the human point of view, a subject close to his heart, as will be seen from his Guest Editorial, presented here.

must chemists remain anonymous?

- **No profession could tell more thrilling tales about its activities, its accomplishments**
- **Without chemists, chemistry is an abstract term, laboratories but piles of brick equipped with instruments**
- **People should be made to understand what the chemist does, what his job means**
- **The campaign for understanding must be as colorful as a mystery novel, as enticing as an ad in a woman's magazine**

Wherever I go, I hear chemists complain that theirs is the least understood of all professions. Doctors, lawyers, dentists, artists, and plumbers, so they sigh, have direct contact with the public; but lo, the poor chemist! Hidden in his laboratory or plant, he remains a nebulous, mysterious creature who must walk through life in anonimity and without recognition.

Must he, really? There is no profession which could tell more thrilling tales about its activities, if someone would only tell them. Can anyone imagine people not being interested to hear the inside story of how, in the last war, American chemists trumped the enemy's incendiaries, overcame the scarcity of rubber, met our lack of quinine, or how they did their part in winning the Battle of Britain with high octane gas?

Lengthen this list with items within your own knowledge, and each will bring the same question to the reader's lips: who were these unknown heroes in smocks, who carried on the war behind the lines? How did they do it? Why have we never heard about them? Why didn't someone at least tell us their names?

Chemists themselves, to whom such exploits are an everyday diet, will ask another question: what is wrong with the men who direct our publicity, that they keep overlooking such rare chances to put us into the headlines? Human interest can always be awakened by interesting stories about interesting men, about their problems, their trials, their triumphs; but the telling must be done, and done with skill. If

we just say that a century ago a Frenchman created the science of bacteriology, few people will be intrigued. On the other hand, if we tell them the life story of Louis Pasteur, it will bring the most lethargic listener to the edge of his chair.

What do our present publicity managers do through speakers, radio and TV demonstrations? They try to entertain the audience with chemical achievements, from artificial germs to modern sewage disposal. But all they ever talk about is the accomplished fact, with utter disregard of the ingenious steps which had to be mounted before the goal was reached. No wonder the listeners think that chemical victories are won without a struggle, if not actually without chemists. True, some matters must remain untold for the time being, but most of them are no longer a secret, and fascinating stories could be fashioned even from such ancient chapters as the development of the Solvay process or of Kekule's discovery of the benzene ring.

Sound Principles, Common Sense

What's the moral of all this? Lesson No. 1 is self-evident. First of all, people should be made to understand what a chemist does; that being one entails more than getting a degree; that his work means battling nature with knowledge, courage, unlimited patience, and sleepless nights.

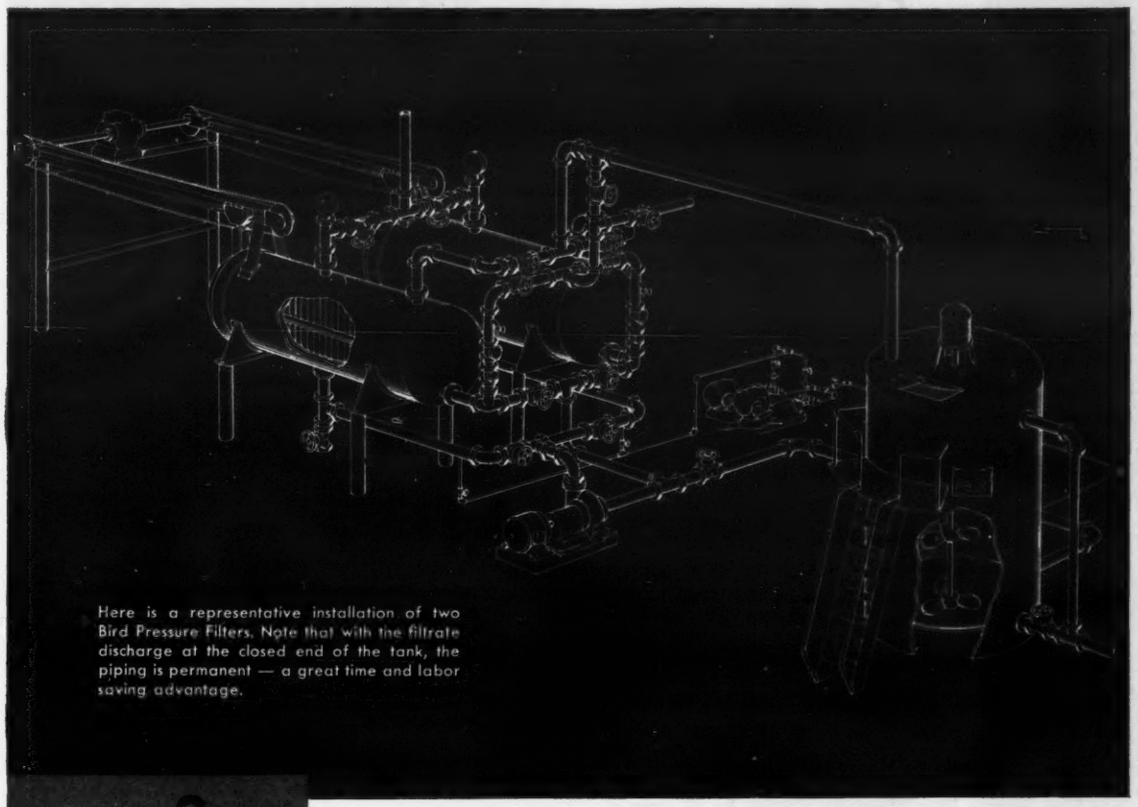
To reach the man on the street we must build on sound principles and common sense. A successful grassroots campaign has to be as colorful as a mystery novel and as enticing as an ad in a woman's magazine. Fortunately, we have the material from which such an appeal can be woven. Each piece of chemical research is a detective story in its own right, and detective stories are an open sesame to the public mind.

However, let us not forget that mystery fans are not satisfied with reading that a murder was solved after years of police work, and that the name of the criminal was John Smith. Yet this is exactly what we are doing, when all we print is that, after years of research, the so-and-so laboratories have succeeded in bringing out this or that new product. Without the human touch, publicity not only falls flat; to the uninitiated it may be downright misleading.

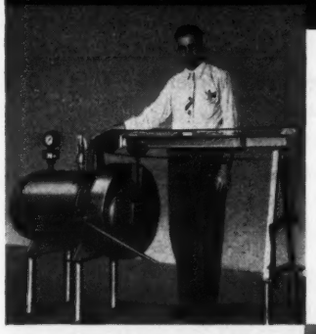
Lesson No. 2 is that, in order to be understood, we need a new sales approach. Let us stop the kind of publicity which gives encyclopedic information on what chemistry is doing. Instead, let us demonstrate that, without chemists, chemistry is an abstract term, and a laboratory no more than a pile of brick equipped with instruments. Only after this elementary truth has been pounded home will the chemist come into his own.

I herewith suggest a moratorium on the glory of chemistry, and an open season for proclaiming the glory of American chemists. If this be heresy, let him who wishes make the most of it.

THE PIPING STAYS PUT
When You Put In
BIRD PRESSURE FILTERS



Here is a representative installation of two Bird Pressure Filters. Note that with the filtrate discharge at the closed end of the tank, the piping is permanent — a great time and labor saving advantage.



Pilot-size units are available for testing performance in advance of installation. The findings are backed by unsurpassed experience in Pressure Filter design and application and by one of the world's finest test laboratories devoted exclusively to the solving of filtration and clarification problems.

The BIRD Pressure Filter is equipped with a new and exclusive *self-sealing filtrate manifold.*

This means that the filtrate discharge can be at the fixed end of the tank — not at the movable end. *You don't have to disconnect the piping every time the Filter is opened and cleaned.*

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BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

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Sparkling FILTRATE

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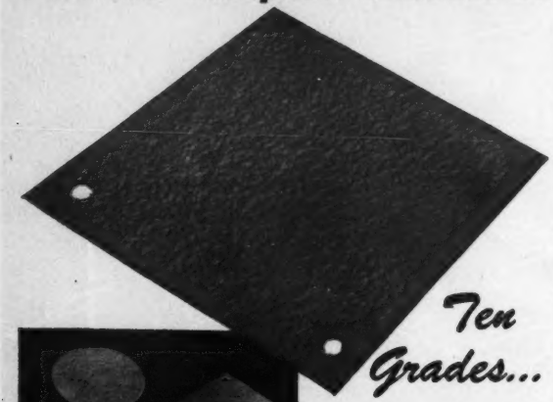
. . . the accepted standard!



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what you can expect in next month's issue...

"Kill two birds . . ." with dust collector

American Sugar Refining Co. of Brooklyn is "killing two birds with one stone" with a wet-type dust collector set up to recover fine particles of diatomaceous earth from flue gas. The collector recovers 90% of the fine particles at a rate of 1500-2000 pounds a day, and also avoids a touchy air pollution problem.

Assistant Editor Ted F. Meinhold is shown above (right) getting first-hand information at American Sugar. Story appears in the "New Solutions" section.

Plastic ducts handle corrosive fumes — still good after 10 years

If all corrosion problems could be solved as Humble Oil did in handling corrosive fumes, plants would have far fewer headaches. Phenol-formaldehyde-asbestos plastic, described in next month's corrosion feature, is still good as new after 10 years.

Intermediate stage development at American Cyanamid

One of the big problems in taking a new chemical from the laboratory to commercial production is the intermediate stage. A story on American Cyanamid's special facilities at the Warners, New Jersey plant will tell how Cyanamid has approached this problem.

In addition to describing the basic thinking behind the new installation, there will be a description of the versatile facilities which Cyanamid has made available to produce quantities of new chemicals sufficiently large to meet medium-scale demand.

The cover illustration and photos of the equipment being used will appear with the story in the June issue.

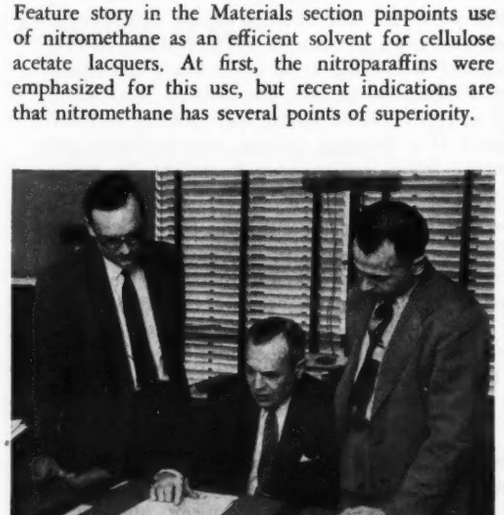
Direct-reading gages work with syrupy compound

Our traveling editors sometimes get wrapped up in their stories to the point of making trip schedules tough to follow. Instruments editor Bruce Fader, working out of Boston, covered a story on direct-reading tank gages which show contents of tanks containing syrupy compounds at Dewey & Almy's Acton, Mass., plant. His interest led to a "bull" session which stretched to the point of nearly missing his Chicago-bound flight.

The story (on schedule), as developed by Bruce and Plant Engineer Sam Drevitch, appears as the Instruments section feature next month.

Nitromethane in lacquers

Feature story in the Materials section pinpoints use of nitromethane as an efficient solvent for cellulose acetate lacquers. At first, the nitroparaffins were emphasized for this use, but recent indications are that nitromethane has several points of superiority.



To get information and formulation data, Assistant Editor Frank McElroy visited Charles D. Goodale at Commercial Solvents Corp's Terre Haute, Indiana, offices.

Photo above shows Mr. Goodale, Manager of Technical Services, discussing a point in the article with Louis L. Hallock (left), Market Development, and Robert H. Dewey (right) of Technical Services.

here's a quick preview of features you'll find in June's Chemical Processing

Aromatics by SO_2 extraction

Low-cost operation in attractive surroundings (see photo) is a keynote in the production of aromatics by the SO_2 extraction method at Continental Oil Company's Lake Charles, La., plant. James B. Daly, Continental's Senior Technologist, and Associate Editor Gordon Weyermuller describe operations at the plant, first to extract benzene, toluene, and xylene simultaneously by the modified process.

Story heads up the "New Solutions" section for June.

Saves $45 a day with sealless pump

I-T-E Circuit Breaker Company of Philadelphia has saved $45 a day since switching to sealless pump which handles trichlorethylene in a parts-cleaning operation. Story is one of many features in the Engineering and Maintenance section next month.

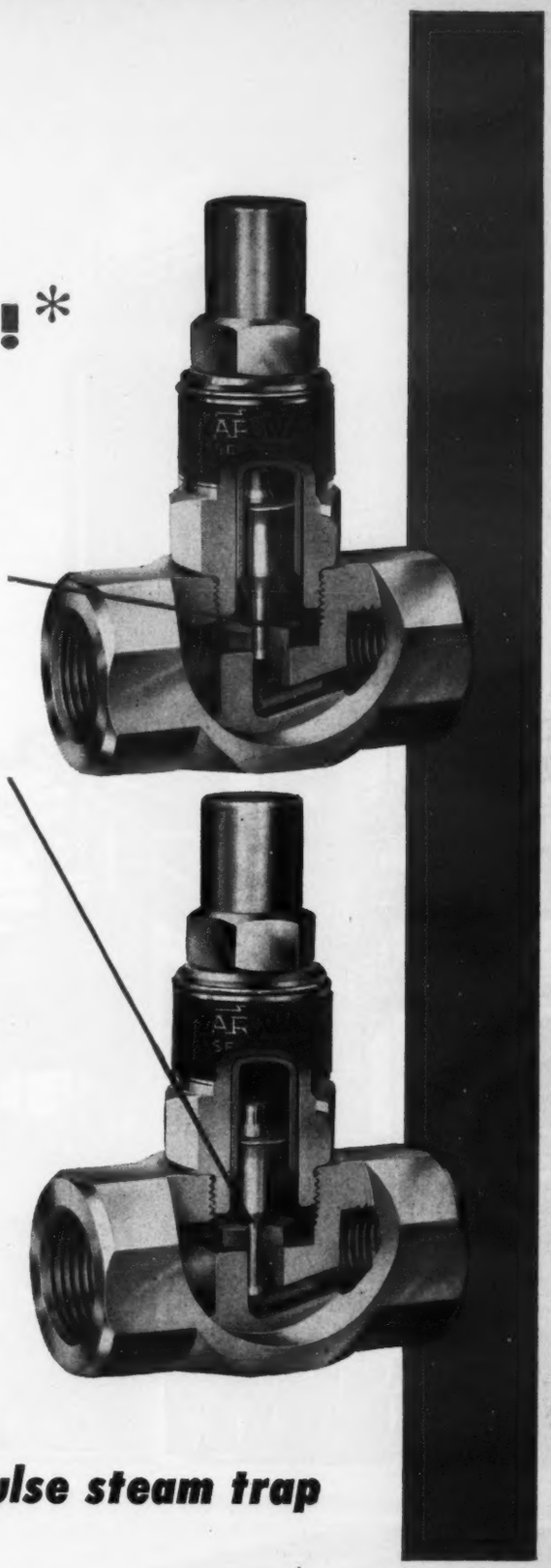
In Brief . . .

Guest Editors in June are Dr. R. W. McNamee and L. E. Erlandson of Carbide and Carbon Co., a Div. of Union Carbide and Carbon Corp., who discuss the economic values of research . . . Operating results at Salt Lake Tungsten Co., Salt Lake City, point up advantages of the Burwell filter, in which one set of frames is cleaned while other filters. Story is a feature article in the Processing section.

And in July . . .

Corrosion Control will be featured again. The feature section we carried in December aroused such enthusiasm that we plan to highlight our regular monthly Corrosion Control section annually in view of the tremendous interest in that field.

IT FLOATS ON THE LOAD! *



You turn on the steam.

This little stainless steel valve—the only moving part in the Yarway Impulse Steam Trap installed on the equipment—opens wide and *stays* open as the air and condensate continuously pour through.

The equipment reaches production temperature in the quickest possible time.

Production temperature reached, the little valve snaps shut. After that, by a pulsating action, it discharges all condensate as it forms—even a tiny teaspoonful. *There's hot steam in the equipment all the time . . .* steady, maximum temperatures are maintained.

It all adds up—to more production per day.

Other profit-making features of the Yarway Impulse Steam Trap—low initial cost, easy installation, stainless steel construction, low maintenance, good for all pressures, quick delivery from over 200 local industrial distributors.

Try a Yarway—free for 60 days—and *prove* its advantage. Your distributor will supply you.

For free Yarway Impulse Steam Trap Bulletin T-1740, write . . .

YARNALL-WARING COMPANY
125 Mermaid Ave., Philadelphia 18, Pa.

* . . . *resulting in fast heat-up of equipment, more production per day.*

YARWAY / *impulse steam trap*

When inquiring check CP 6656 opposite last page

With high yield and low maintenance, Udex process assures production of —

pure petrochemicals

Outstanding advantage resulting from the use of the solvent method for recovery of aromatics, the Udex process, at Sun Oil's new petrochemical plant at Marcus Hook, Pennsylvania, is the high purity of the products obtained. Plant went on stream Dec. 6, 1953. At present, 19 million gallons of benzene and 30 million gallons of toluene per year are being produced with the Udex unit. About 15 million gallons of xylenes is also being produced although this product is not purified in the Udex unit but in conventional distillation equipment at the plant.

High purity of the benzene is shown by the freezing point of 5.3°C, the absence of thiophene, and the low bromine index. High purity of the toluene is apparent from the low paraffin content; Sun's product normally contains no paraffin whatsoever. The low bromine index is also an indication of the premium quality of the toluene.

In addition to producing a pure product, process is efficient, economical, and has required only a minimum of maintenance. Unit has consistently shown recoveries approaching 100% of benzene, and from 95% of toluene at design rates to about 90% at rates substantially above design.

Process can handle a feed stock with a wide boiling range. At Sun, the feed stock, which comes from Houdriforming operation, has a boiling range of 100°F, from 140 to 240°F. This feed stock consists of paraffins and some unconverted naphthenes as well as about 15% benzene and 25% toluene.

Solvent employed in the Udex process is a mixture of diethylene gycol and water. One of the principal reasons for the high product purity is the high selectivity of the solvent, combined with its high solubility for aromatics. Its high boiling point makes it possible to distill the dissolved aromatics from the solvent rather than the reverse, lowering utility costs. Low solubility of the diethylene glycol in non-aromatics and its high solubility in water permits a clean separation of the solvent from the raffinate without distillation.

Process Flow

Process uses a multi-stage countercurrent extraction column. Diethylene glycol-water solvent is introduced at the top of the column, hydrocarbon feed at an intermediate point, and hydrocarbon reflux at the bottom. Extractor pressure is just high enough to keep both hydrocarbon and solvent in liquid phases. Since temperatures and pressures are low and the system is non-corrosive, carbon steel equipment is used throughout the unit.

Diethylene glycol solution coming from the extractor, containing the aromatics, is taken to a stripper where the aromatic fractions are separated from the solvent. After water wash to recover traces of solvent, the aromatics are given a final clay treatment. The aromatics then pass through two distillation columns, benzene being recovered from one and toluene from the other.

(*Continued on next page*)

Typical Analysis

BENZENE		TOLUENE	
Purity, mol %	99.6	Purity, mol %	99.9
Freezing point, °C	5.3	Paraffins	Nil
Thiophene content	Nil	Hydrogen sulfide, sulfur dioxide	None
Bromine index	Negligible	Bromine index	Negligible
Acid wash color	1	Acid wash color	1

(*Continued from preceding page*)

Mixed xylenes fraction coming from Houdriformer is clay-treated and fractionated in conventional distillation equipment, not a part of the Udex plant.

Entire Udex plant is provided with automatic instrument control of the various individual process steps, such as level control, flow rate, and pressure control. However, all of these steps are subject to the overall control of the operating

Automatic instrument control assists in maintenance of product quality

personnel. About four men per shift are used for operation of the unit.

Low maintenance requirements are illustrated by experience during first general shutdown of plant during October 1954, after ten months operation. Almost no maintenance work was required during this shutdown. Maintenance that has been needed while plant was operating has been of a minor nature, consisting mainly of correction of steam and condensate leakage, alignment and packing of pumps, and adjustment of instruments.

(Udex Process is licensed by Universal Oil Products Co., Dept. CP, 30 Algonquin Rd., Des Plaines, Ill. . . . or for more information check CP 6657 on handy form opposite last page.)

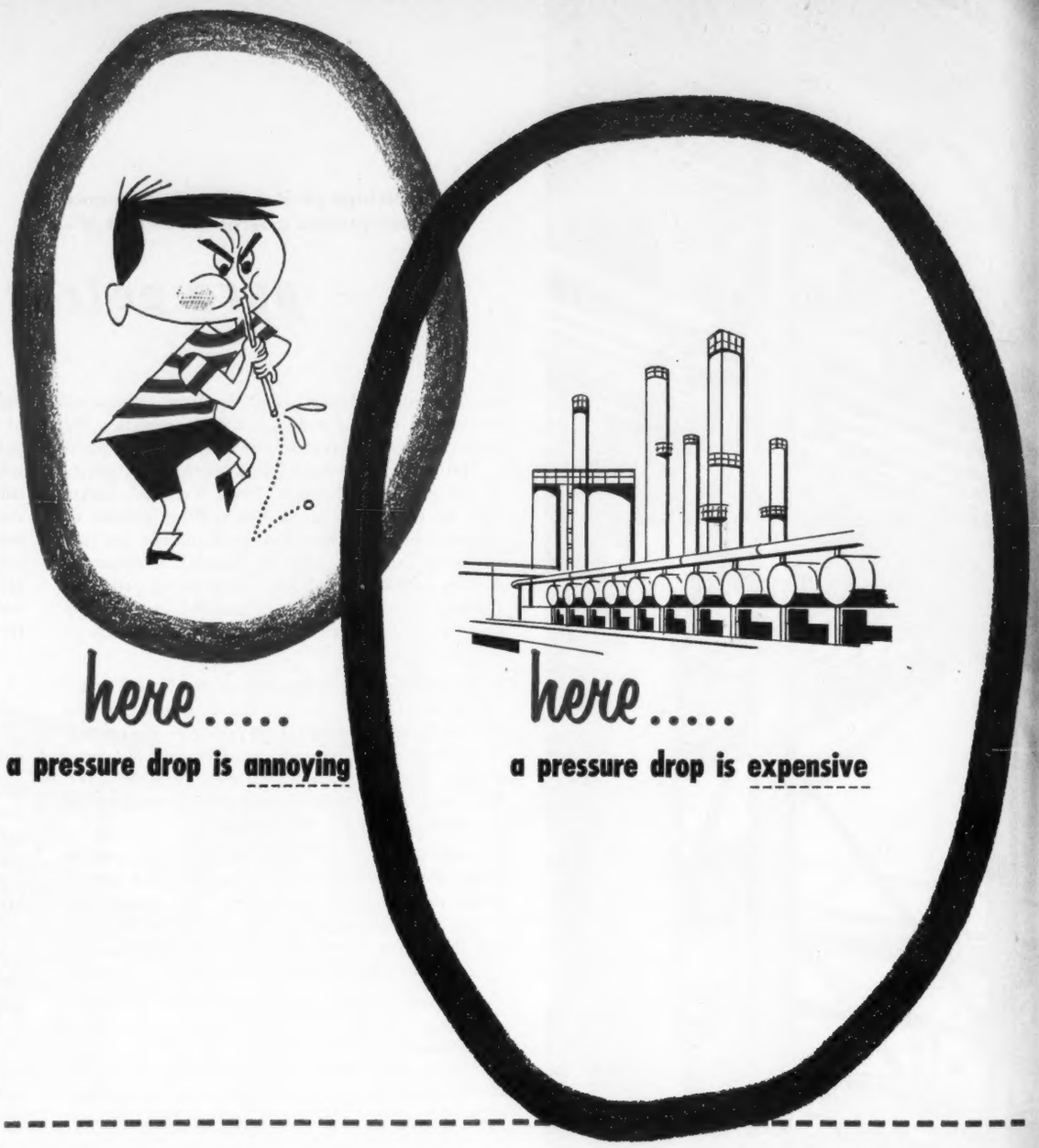
(For more information on aromatics contact Dept. CP, Sun Oil Company, Industrial Products Dept., 1608 Walnut St., Philadelphia, Pa. . . . or check CP 6657A on handy form opposite last page.)

Use automatic load-cell system in liquid blending operation at Naugatuck Chemical . . .

one-man operation gives accuracies higher than those using metering-type blending processes

Naugatuck Chemical Division of United States Rubber Co. has put its new latex blending operation on stream in its Kralastic plant at Baton Rouge.

Unusual feature of this operation, which auto-



here.....

a pressure drop is annoying

here.....

a pressure drop is expensive

IT PAYS TO LOOK AT THE ADVANTAGES OF USING GLOBE SEAMLESS WELDING FITTINGS

Welded Construction Takes Less Space — Piping can be nested in corners, or fitted against ceilings, walls or equipment. Dimensional accuracy permits cut-offs at odd angles when necessary.

Welded Construction is Easily Insulated—Insulation is simplified by the absence of complex flanged assemblies. Because joints are leakproof, insulation is permanent and maintenance free.

Welded Construction is Simple to Install—Dimensional accuracy of angles, radii, and bevels, assure quick and easy joining. Any qualified welder can do the job efficiently and economically.

Whole Sections Can Be Shop-Fabricated — For fast installation, or where working space is limited, entire sections can be shop-fabricated and installed by any qualified welder in a few minutes.

Welded Construction is Permanent — Maintenance costs are kept at a minimum because piping is permanent and leakproof. The strength of the weld approaches that of the pipe itself.

Welded Construction is Lightweight — Strength combined with lightweight permits easy handling in installation. Unwieldy sections can be joined on the ground, and then fastened into position.

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COMPARISON PROVES THE PRACTICALITY OF GLOBE WELDING FITTINGS

These 4 factors increase friction, create turbulence and consequent erosion and cause pressure drop. Note how they are eliminated with welded construction using Globe Alloy Welding Fittings.

A CIRCULARITY — True circularity throughout insures accurate alignment when special odd-angle sections are cut. Full diameter throughout protects against pressure loss due to flattened or angular surfaces.

B RADIUS—Uniform gradual change of direction provides smooth even flow — less resistance to directional changes.

C SMOOTH INNER WALLS—No waves or ridges within the fitting to impair flow — no buckling of metal along the short inner curve — no stretching on the outer curve. This also prevents premature piping system failure.

D SMOOTH JOINTS — Uniform wall thickness, machined bevel ends, and perfect agreement between fitting and pipe sizes assure automatic and perfect alignment. The smooth welded joints present no interruption to flow.

here's how

GLOBE SEAMLESS ALLOY WELDING FITTINGS ASSURE MINIMUM PRESSURE LOSS!

Welding Fittings remove all "road blocks" from the flow of material. They present a gentle transition in contour, smooth inner walls free of pockets or crevises within the joints. Flow of material is speeded, erosion due to turbulence is minimized adding years to the life of the piping system.

This efficient piping flow reduces maintenance costs, reduces pumping power requirements and investment in equipment.

Globe Seamless Welding Fittings

GRADES: Carbon, Alloy and Stainless Steels.

TYPES: Elbows, Tees, Caps, Saddles, Laterals, Nipples, Returns, Flanges, Stub Ends, Reducers, Crosses, Bull Plugs.

SIZES: Complete range of sizes and schedules.

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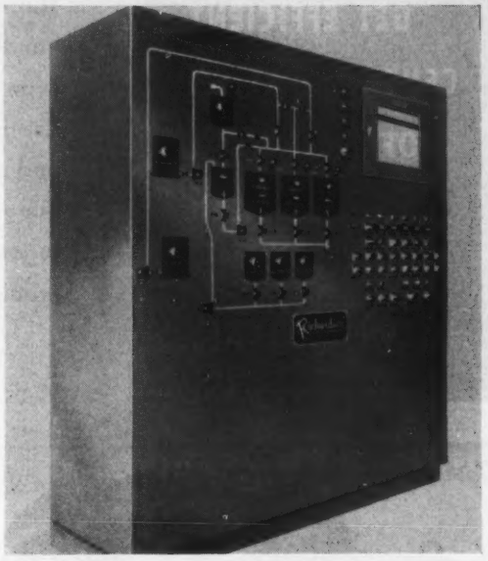
When inquiring check CP 6658 opposite last page



Six liquid products are blended automatically in system which employs load cells

matically blends up to six liquid products, is use of load cells to perform weighing and proportioning of individual liquid products.

In the blending operation, resin latices and other liquids are automatically taken from storage tanks, weighed out in prescribed quantities, mixed and discharged from system. Weighing takes place in any of four tanks.

Load cells are located beneath the four tanks, three cells per tank. Weights are indicated and recorded on instrument located at remote panel control board. Individual feeding and weighing operations are controlled by operator at control board.

Three tanks are equipped with agitators and are used for mixing as well as weighing. (Their capacities are 10 tons each, while fourth tank has one-ton capacity). With this arrangement, production of latex blends is virtually continuous.

Flow scheme of process is laid out on control board. Lights show which valve is open, which material is feeding. All feeding cycles are initiated by pushbutton on board. Pilot lights flash when each feeding step is completed. Weight-selector dials are located on silhouettes of storage tanks.

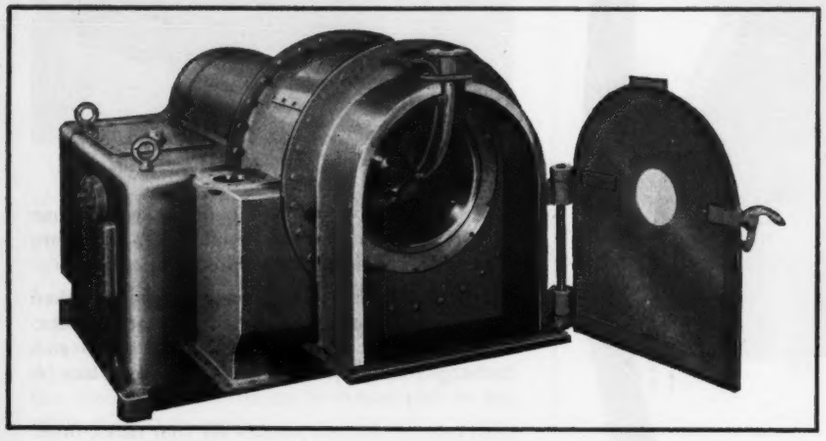
Strip chart recorder, located on panel, has a 200-graduation scale. When recording weight in 10-ton tanks, it reads to nearest 100 lb. For one-ton tank it reads to nearest 10 lb.

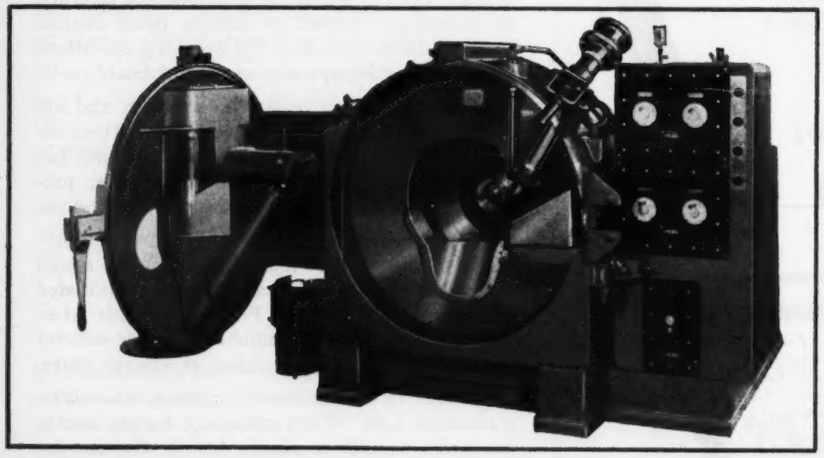
Instrument has been built to work with four weighing sources (3 weigh-mix tanks and one weigh tank) instead of customary one source.

(Blending system was designed by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. . . . or check CP 6659 opposite last page.)

GET EFFICIENT CENTRIFUGATION OF FILTERABLE SLURRIES WITH CENTRIFUGALS

These two types of Baker Perkins centrifugals will handle practically any kind of filterable slurry. The Type S Continuous and the Type HS Universal Filtering Centrifugal are available in a wide range of capacities, and all units are low in power requirement and operating cost. A B-P sales engineer is a specialist in centrifugation so why not let him help you with your product problems. Write, or call us today.





BAKER PERKINS INC.

304

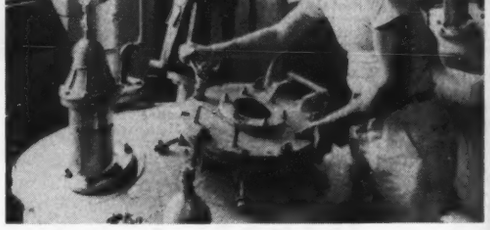
CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN

When inquiring check CP 6660 opposite last page

Eli Lilly cuts maintenance costs by using PVC pipe

solves corrosion problems, ends leakage hazard

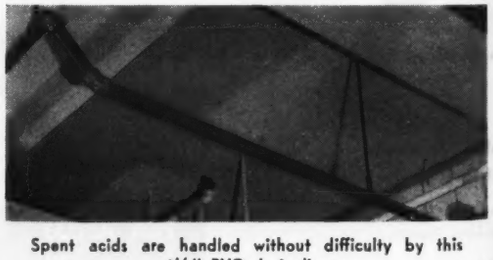
Problem: Steel pipe handling corrosive chemicals at Eli Lilly and Company, Indianapolis, Indiana, required considerable maintenance to keep in operating condition. Leaks could be dangerous since hazardous chemicals were involved.



Ether-precipitating vessels have ¾" vacuum lines fabricated of unplasticized polyvinyl chloride

Solution: Company replaced the steel pipe with unplasticized polyvinyl chloride pipe. Fabricated with injection-molded screwed fittings, pipe is easy to install and disassemble. Inert and nontoxic, it has no effect upon the high-grade pharmaceuticals being produced in the plant.

In one application, ¾" PVC vacuum lines were installed on vessels employed in precipitating ether. In another, 1¼" pipe is handling spent inorganic and mineral acids. Dilute sulfuric acid (½%) is carried to a cooling tower by 1" PVC pipe in a third application.



Spent acids are handled without difficulty by this 1¼" PVC drain line

Results: Pipe has solved corrosion problems and eliminated leakage hazards. Initial cost is reported lower than metal corrosion-resistant pipe.

(PVC fittings are product of Tube Turns Plastics, Inc., Dept. CP, 224 East Broadway, Louisville 1, Ky. Check CP 6661 opposite last page.)

Lubrication "headaches" stopped by one grease . . .

it can "take" high temps and water, thus saving paper company costly downtime

Problem: Keeping grease in the lateral adjustment of corrugator rolls was the biggest difficulty encountered by maintenance men at the North Bergen, N. J. plant of Gibraltar Corrugated Paper Co. These rolls, heated with 160 psig steam fed through a hollow journal, reach temperatures up to 370°F. The several kinds of grease tried were unsatisfactory because they would break down under the constant high heat.

Proper lubrication is vitally important in this operation since the equipment is run around-the-clock, six days a week. Keeping only one machine idle for four hours, for example, would mean a costly loss of some 800,000 sq ft of corrugated board.

Solution: Gibraltar changed to a multi-purpose grease which uses lithium 12-hydroxy stearate as the soap. It has excellent resistance to breakdown under high heat conditions.

Results: In its first application, in the lateral adjustment of corrugator rolls on the single facer (which puts the "wrinkle" in the center sheet of corrugated board), this lithium-base grease proved its ability to "take" the heat of the journals. Encouraged by these results, maintenance men tried the same grease for other applications in the plant and met with equal success, even where water is encountered and lubrication of journals and bearings becomes quite a problem from an entirely different standpoint.

Lateral adjustments on corrugator rolls are lubricated once a week with lithium-base grease

Proper lubrication using lithium-base grease in all applications is now part of Gibraltar's preventive maintenance program. It has saved untold hours of costly downtime.

(Alvania lithium-base grease is a product of Shell Oil Company, Dept. CP, 50 W. 50th St., New York 20, N. Y. Check CP 6662 opp. last page.)

This Cleveland, now driving an octagonal thickener in a New England paper mill, is a real "old timer". Originally installed nearly 40 years ago in a different application, it is still on the job after so many years of consistent service.

Where you can use a Worm Gear Drive to best advantage

WHEREVER power transmission calls for a compact, safe, space-saving speed reducer, a Cleveland worm gear drive is your first choice.

The right angle construction of a worm gear saves space. High shock load resistance and efficient performance are inherent. Parts are reduced to a minimum. There's smooth, uninterrupted torque flow and quiet running. Correct gear alignment is maintained. Gearing is enclosed in an oil bath, assuring positive lubrication, minimum maintenance and safety for operators. The case hardened steel worm and nickel-bronze gear actually improve with use, adding to long life. And, with Clevelands, you get the extra advantages of the 42 years' experience of specialists in building worm gears.

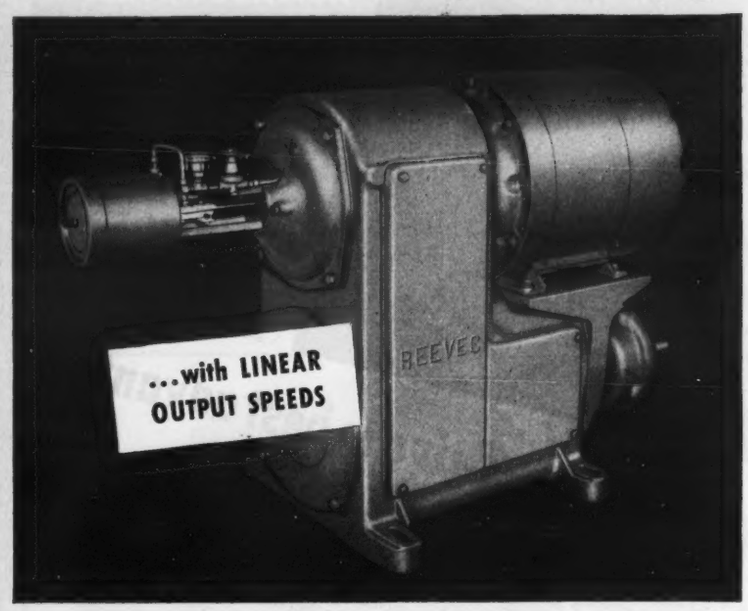
In thousands of cases, Cleveland speed reducers have operated for the life of the driven machine through years of severe service. Get the complete Cleveland story, before you install a speed reducer; see how much Clevelands can do for you. Write for helpful technical advice and ask for Catalog 400. The Cleveland Worm and Gear Company, 3237 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

When inquiring check CP 6663 opposite last page

New Automatic Speed Control for Continuous Processing



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Exclusive REEVES cam design provides linear output speeds so necessary for delicate proportioning processes . . . maintains the greatest accuracy while regulating or maintaining any speed throughout the range of the Motodrive.

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When inquiring check CP 6664 opposite last page

Controls flow of Dowtherm vapor going into heat exchanger to regulate temp . . .

pneumatic valve has sensitive, fast response

Problem: In order to heat resin kettles to 350°F, Sherwin-Williams Company uses liquid Dowtherm at its Chicago plant. Heat exchange liquid is heated by second Dowtherm system employing 600°F Dowtherm vapor from boiler. Dowtherm vapor generator, already installed for other processing operations, had sufficient capacity to heat Dowtherm for resin kettle jacket. To control flow of Dowtherm vapor to heat exchanger, a pneumatically-operated valve with fast response was needed to minimize temperature cycling and prevent overshooting.

Solution: Sherwin-Williams installed Series LB Conomotor Control Valve, a single-seated, split-body valve with renewable seat ring, actuated by cylinder operator. Unit is powered by springless diaphragm motor. Valve will go through full stroke in from 2 to 5 seconds with a change in instrument output from 3 to 15 psi. Speed of response is achieved without loss of stability by small volume chambers above and below piston head and by use of specially-designed extra capacity built-in

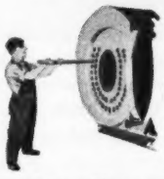
Valve is mounted between Dowtherm vapor generator and heat exchanger

positioner. Intermediate boosters or relays are not required. Unit is responsive to instrument output changes as low as 0.2 inches of water, or well over one part in thousand of instrument output span.

Cylinder Conomotor operates by varying differential air pressure across piston head. Underside of piston is pressurized by cushion-loading reducing-relief valve to suitable air pressure ranging from 5 to 10 psi. Top side of piston is automatically loaded through force balance positioner to any pressure up to 100 psi required to hold stem position dictated by primary controller.

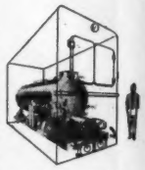
In the built-in positioner, instrument air pressure

Cyclotherm Steam and Hot Water Generators range from 18 to 500 hp . . . from 15 to 200 psi.



Cyclotherm's simplified maintenance sends costs down as much as 50%. Reduces hours of "down time" to minutes. Any maintenance man can clean return tubes . . . replace and clean burner nozzle. Firetube never needs cleaning.

A minimum 80% efficiency is guaranteed. Cyclotherm burns oil and/or gas. Gives 66% more steam generating power per sq. ft. Is up to ⅓ smaller than other packaged boiler units. Can be installed in minimum boiler room space . . . with only 5 simple connections.



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Oswego, N. Y.

When inquiring check CP 6665 opposite last page

exerts upward force on large center diaphragm. Because of difference in diaphragm areas, this force, plus upward force of main spring, is balanced by downward force of suppression spring. In balance, small pilot flow provides instant response to any change in control instrument air pressure.

Increase in control instrument air pressure raises diaphragm assembly, closes exhaust, and opens inlet pilot valve. Subsequent increase in valve pressure moves piston downward. When valve stem is in position dictated by control air pressure, forces are again in balance.

Results: By using Conoflow valve and Dowtherm system, Sherwin-Williams is able to control resin cooking temperatures to within ±2° at approximately 350°F. Accurate control of Dowtherm vapor to heat exchanger enabled Btu's of vapor generator to be utilized. Virtually maintenance-free since its installation control valve has insured consistent quality of resins with a minimum of additional equipment and cost.

(Series LB Conoflow Valves are a product of Conoflow Corporation, Dept. CP, 2100 Arch St., Philadelphia 3, Pa. . . . or for more information check CP 6666 on handy form opposite last page.)

Remove scale deposit from scrubber without shutting down unit

How chemical cleaning method removed scale accumulations from a high-pressure gas scrubber and eliminated downtime, is told in two-page bulletin. Cleaning was accomplished without shutdown by substituting solvents for the scrubbing water. It formerly took 36 hours downtime to clean unit by mechanical means.

Bul on gas scrubber cleaning is issued by Dowell Incorporated, Dept. CP, P.O. Box 536, Tulsa 1, Oklahoma. When inquiring specify CP 6667 on handy form opposite last page.

New solutions of corrosion problems in July CP

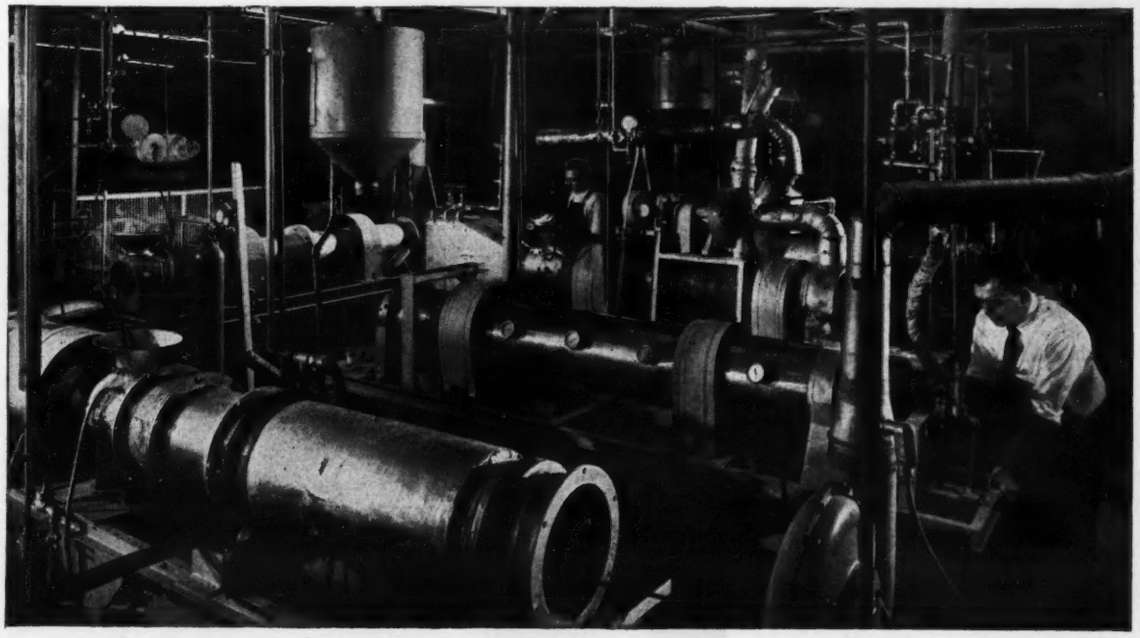
If you have corrosion problems, be sure to see the July issue of CHEMICAL PROCESSING, which will feature Corrosion Control. Among other articles will be a number of case history stories telling how other plants have stopped corrosion.

Louisville Method

In our lab, small Louisville Dryers solve big drying problems for customers

Here's where Louisville Dryer performance is proved *before* you buy. In our East Chicago pilot plant, pilot dryers duplicate on a small scale the exact conditions of any drying process. From their operation, our drying specialists get the answers to questions like these: What size should it be? Which dryer type is best? What special design features will improve operation? What experience from our thousands of installations can best be applied to this problem?

Advance testing in our pilot plant is just one of the steps we take to make sure every Louisville customer gets more than satisfactory results. From initial surveys by drying engineers to follow-up checks after installation, Louisville insures maximum performance from your dryers. Why not take advantage of these facilities? A Louisville engineer will be glad to look over your drying operation. There's no obligation . . . and the savings that may result are all yours.



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over 50 years of creative drying engineering

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For dependability see General American—creative engineering, design, construction, installation

When inquiring check CP 6668 opposite last page

Imparts stability to grease . . .

gelling agent also increases adhesiveness to metal

Principal reason Bel-Ray Co., Inc., Madison, N. J., selected gelling agent (organic derivative of hydrous aluminum silicate mineral) for use in their Polylube grease, when commercial production was undertaken three years ago, was because of the stability it imparted to the product. Material doesn't change on working. It can be used at temperatures up to 500°F or more.

Gelling agent also has good low-temperature stability, with no crystallization occurring. Another advantage obtained is increased adhesiveness of the grease to metal, and water stability.

Gelling agent is supplied as a finely divided powder. Sp gr is 1.80.

(Bentone 34 gelling agent is product of National Lead Co., Dept. CP, 111 Broadway, New York 6, N. Y. . . . or for more information check CP 6669 opp. last page.)

Plant substitutes tank car for NH_3 storage tank

Rather than spend a lot of money for an expensive tank arrangement, Agricultural Fertilizer Company, Edison, California, uses a tank car for storing ammonia. Company needs the material to ammoniate phosphates.

The car, together with an LPGA transfer unit and a small inexpensive ammonia tank with liquid level controller, completes the ammonia-handling system. Metering device in the line leading to fertilizer mixer automatically controls amount of ammonia for each batch.

(Ammonia-handling system was designed by Worthington Corporation, Dept. CP, Harrison and Worthington Avenues, Harrison, N. J. Check CP 6670 opposite last page.)

Stainless Steel equipment helps J. T. Baker Chemical Co. maintain product purity

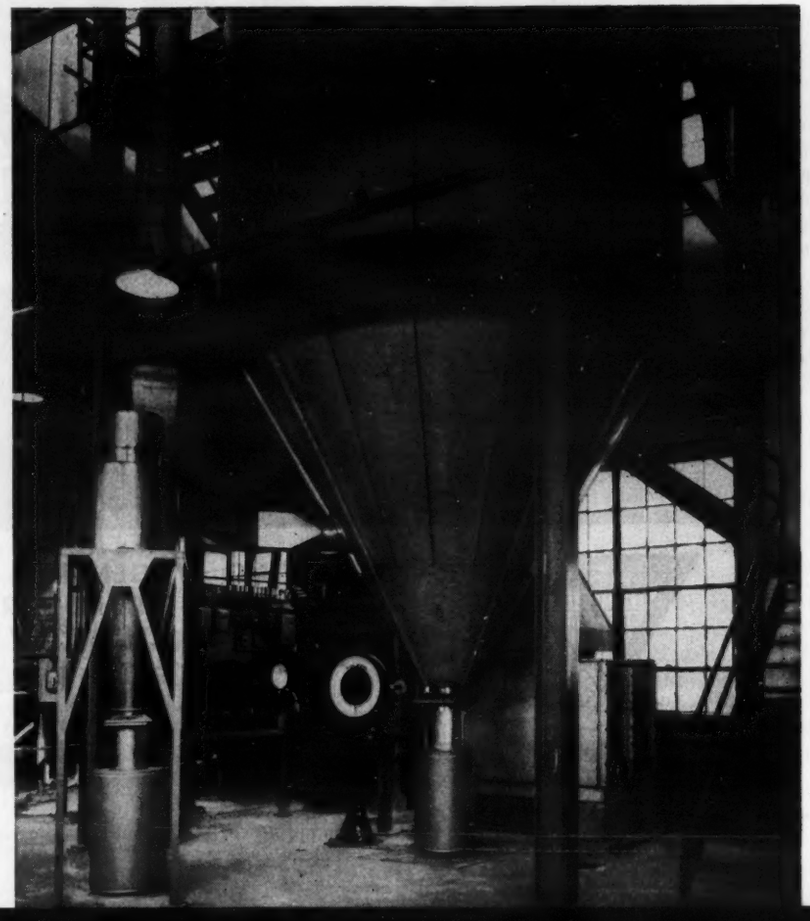
FOR 50 years, the J. T. Baker Chemical Co., Phillipsburg, N. J., has been supplying "Baker Analyzed" Reagents and other laboratory chemicals to industrial, pharmaceutical and educational users. Commercial quantities of Baker Chemicals are used in the pharmaceutical, electronics, photographic film, color and other key industries having specialized requirements for chemical purity.

The company has built its reputation on the purity and precision of its products and takes every precaution to insure these qualities. That's why Stainless Steel is used at all critical points in processing such chemicals as nitrates, acetates, sulfates, chromates, phosphates, carbonates and molybdates.

Stainless Steel is used in filters, pumps, reactors, pipes, valves, fittings and storage tanks. Even the ventilating system equipment in temperature and humidity-controlled rooms is Stainless Steel.

Company officials have found that Stainless Steel not only guards purity better and is easier to clean and keep clean, but it also has a life expectancy of 6 to 1 over other commonly-used materials.

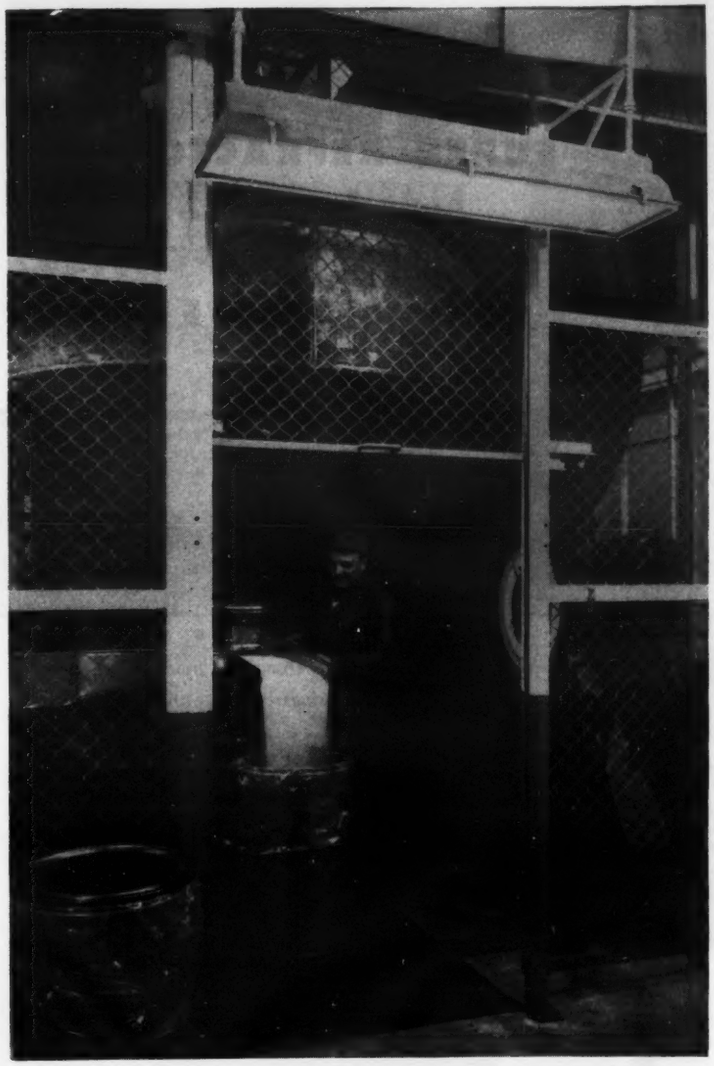
If you are not taking full advantage of these qualities of Stainless Steel in your operations, investigate today. And when you purchase Stainless equipment, be sure to specify perfected, service-tested USS Stainless Steel; it is made to give you the finest performance.



STAINLESS STEEL spray dryers are used to dry many of the pure chemicals produced by Baker.

PACKAGIN
and humi
fabricated

PACKAGING REAGENTS under controlled conditions of temperature and humidity. Stainless Steel automatic dispensing equipment fabricated by Exact Weight Scale Company, Columbus, Ohio.



FOR ABSOLUTE UNIFORMITY, Baker chemicals are blended in Stainless Steel double-cone tumblers with capacities up to 10,000 pounds. This tumbler was fabricated by Blaw-Knox Company, Pittsburgh, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · TUBES · WIRE · BARS · BILLETS · PIPE · SPECIAL SECTIONS

4-1859

Clarifies process water at Heyden Chemical . . .

filter is easy to dismantle, has low maintenance

High product purity is maintained at the Fords, N. J., plant of Heyden Chemical Corporation by the use of a 12" diameter cartridge-type filter for clarifying process water. Rust and sediment are completely removed by the unit, which was placed in service about two years ago.

Filter assembly consists of a number of asbestos discs enclosed in a sealed housing. Handle on top enables unit to be closed tightly so it can withstand pressures up to 100 psi without leaks. Compression which occurs on filter discs at top and bottom insures complete filtration of liquid.

Removes rust from process water

Every one to two months, the filter is cleaned and cartridges are replaced. According to Heyden, unit is easy to dismantle and has required a minimum of maintenance since it was placed in service.

(Filter is product of Alsop Engineering Corp., Dept. CP, Milldale, Conn. Check CP 6671 on handy form opposite last page.)

For more information on product at left, specify CP 6672 . . . see information request blank opposite last page.

3-part sinker assembly for eliminating steel wire
Acid-spray nozzle
Refractory pipe coupling for handling acids and other corrosive materials
Burner tip for acid sludge

NEW
SUPER REFRACTORY has METAL-LIKE PROPERTIES up to 3000° F

The refractory parts you see above are made of REFRAX® silicon-nitride-bonded silicon carbide. CARBORUNDUM has developed it to fill the need for a material that can be formed into intricate parts with metal-like properties for use at temperatures far above the melting points of the most expensive alloys.

Prices are practical. Since REFRAX parts are supplied in ready-to-use shapes, they are usually far less expensive than high-temperature alloys. In one case, REFRAX brazing fixtures cost only 1/15 as much as the alloy they replaced and gave better than 150 trips without deformation whereas the alloy fixtures needed frequent straightening and refinishing.

Here are some facts and figures that show how well REFRAX materials can answer the special requirements of complicated parts for low to high-temperature service:

TOLERANCES TO ± 0.005 in./in.
These materials can be produced in intricate shapes to accuracies of ± 0.005 inch per inch, with or without external or internal threads. Surface finish resembles that of a cast metal part. *Unlike many metals, REFRAX shapes show little or no warpage after repeated heating and cooling cycles.*

HIGH HOT STRENGTH
At 2450°F, REFRAX refractories have a modulus of rupture of 5600 psi. Even the best heat-resistant alloy melts below this temperature.

HIGH HEAT CONDUCTIVITY
The heat conductivity of REFRAX materials approaches that of chrome-nickel steels.

UNAFFECTED BY MOST ACIDS
The new refractory is inert to most acids at temperatures that range from moderate to extreme. It also stands up against molten slags and molten synthetic mica. Even molten aluminum leaves REFRAX shapes unharmed.

Does this new group of refractories offer a practical solution to your special problem? It's easy to find out—simply write us for full details. If you wish, describe the application you have in mind. We will be glad to advise you whether REFRAX materials will be suitable. Address Dept. S55 Refractories Division, The Carborundum Company, Perth Amboy, N. J.

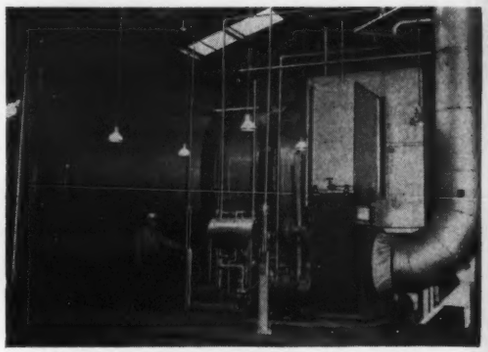
CARBORUNDUM
Registered Trade Mark

. . . also offers these advanced special-purpose super refractories: silicon carbide • fused aluminum oxide • electric furnace mullite • stabilized zirconia • boron nitride • boron carbide • zirconium boride • titanium boride • chromium boride • molybdenum boride • nickel aluminide.

When inquiring check CP 6673 opposite last page

Pure polyvinyl chloride assured through use of stainless steel rotary dryer

Problem: Product purity was a primary consideration in selecting processing equipment for the recently opened polyvinyl chloride plant of The General Tire & Rubber Company at Ashtabula, Ohio. Drying equipment was required that would not contaminate the product. Dryer had to be able to handle 25 million pounds of material per year.

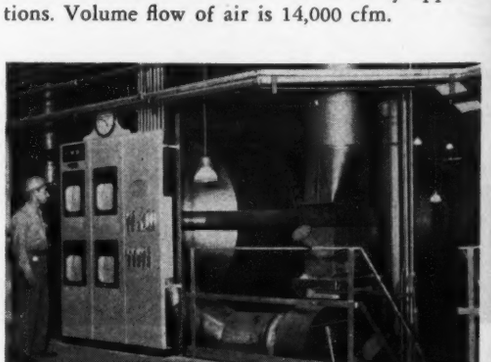


Rotary dryer in use at General Tire & Rubber

Solution: After considering a number of different methods of drying, company selected a Louisville stainless steel rotary dryer. General Tire's favorable experience with this type of dryer at its Baytown, Texas plant was one factor which led to this particular selection.

Dryer, which makes extensive use of automatic instrumentation, is fabricated from solid stainless steel, ⅜" thick. Shell is 10′ in diameter and 30′ long. Flights on interior of shell lift material to top of dryer as it rotates and drop it through annular space. Rotational speed is 2 rpm. Unit has a pitch of ⅛" per foot from the back to the front.

Preheated air is blown through dryer. In this unit, air is heated externally and passed with the polymer through the dryer instead of relying on conventional internal steam tubes used in many applications. Volume flow of air is 14,000 cfm.



Dryer makes extensive use of automatic instrumentation

Product leaves slurry blend tanks and goes to three Sharples centrifuges, where moisture is reduced to about 30%. Material then passes by screw conveyor to dryer. Product leaves dryer at 0.5 to 0.6% moisture and goes through air separator to bagging operation.

Results: High purity of the polyvinyl chloride has been made possible by use of the stainless steel dryer. Since unit was placed in operation in October 1954, it has worked very well, having economically handled the required volume of material. No maintenance except lubrication has been necessary.

(Plant was engineered and designed by Scientific Design Company, Dept. CP, 2 Park Ave., New York 16, N.Y.)

(Rotary dryer is product of Louisville Drying Machinery Unit, General American Transportation Corp., Dept. CP, 139 S. Fourth St., Louisville 2, Ky. . . . or for more information check CP 6674 on handy Reader Service slip which is located opposite last page.)

FluoSolids system simultaneously drys and classifies solids

FluoSolids system for simultaneously drying and classifying minus 3/8 inch particles is described in four-page bulletin. Major advantages, theory, background, and typical applications are presented. Booklet includes wash drawing of typical unit and cites operating data from two drying and dedusting installations.

Bul 7502 is issued by Dorr-Oliver Inc., Dept. CP, Barry Place, Stamford, Conn. When inquiring reader may simply specify CP 6675 on convenient Reader Service slip which is located opposite last page.

Discusses waste water reclamation for industrial purposes

Treatment of sewage plant effluent for water reuse in process and boiler feed is discussed in eight-page reprint. Fully documented and illustrated, article examines current developments and design factors in use of this potentially rich source of water. Typical plant layouts and result sheets are shown. Bibliography is provided for those who wish to investigate subject further.

Technical reprint T-129 is issued by Graver Water Conditioning Company, a Division of Graver Tank and Manufacturng Compay, Inc., Dept. CP, 216 West 14th Street, New York 11, New York. When inquiring specify CP 6675A on handy form opposite last page.

HOW STAINLESS STEEL *brings a whole set of advantages to critical processing jobs*

This 60-inch diameter nitric acid absorber tower typifies the application of stainless steel in the chemical processing industry. Made by the Vulcan Manufacturing Division of Cincinnati, Ohio, it is an excellent example of how several properties of a *specific type* of stainless team up to solve a tough chemical processing problem.

The stainless that Vulcan chose for the all-welded body is Crucible Rezistal® Type 347. Here are three big reasons why:

High tensile strength to minimize structural support.

Stability against formation of harmful carbides, both during welding and in high-temperature operation.

Remarkable corrosion-resistance to withstand lasting exposure to nitric acid. It is fully resistant to the acid in diluted form at any temperature, and to concentrated solutions at lower temperatures. It is satisfactorily resistant to concentrated solutions above the boiling point.

Your operations may not call for nitric acid absorber towers, but if they include any critical phase of chemical processing, check the many advantages offered by the 30 available types of Crucible stainless steel. You'll find details in "Making the Most of Stainless Steels in the Chemical Processing Industry," which is yours free on request. And, to find out what information is available on the many other Crucible special steels, ask for "Crucible Publication Catalog." Or consult your nearby Crucible representative. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

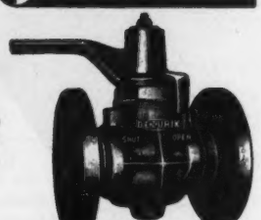
Crucible Steel Company of America

When inquiring check CP 6676 opposite last page

A Full Range of Metals in DeZURIK

IRON or STEEL
BRONZE
ACID RESISTING BRONZE
NI RESIST
STAINLESS STEEL
MONEL
HASTELLOY
NICKEL
ALUMINUM
OTHER ALLOYS

VALVES

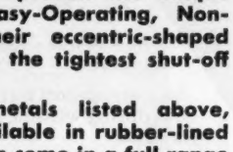


There's a DeZurik Valve to handle almost anything piped—from acetic acid thru ethylene glycol and potassium dichromate to zinc sulphate.

The wide range of applications in the chemical processing industry has proved the unique qualifications of DeZurik Easy-Operating, Non-Lubricated Plug Valves. Their eccentric-shaped resilient-faced plugs provide the tightest shut-off for the longest time!

In addition to the metals listed above, DeZurik Valves are also available in rubber-lined models. These versatile valves come in a full range of models, too . . . with manual, remote or automatic operation.

PLUGS



Plug facings are supplied in several materials: Hycar rubber in three compounds, Neoprene in three compounds, and Teflon. For high temperature services, plugs can be furnished with metal faces.

Write for details and recommendations

DeZURIK SHOWER CO.
SARTELL, MINN.

When inquiring check CP 6677 opposite last page

Economical, easy-to-install clad steel in pipe still at Humble Oil —

stops corrosion from sulfur compounds, hydrochloric acid

Bond between metals is so good that boilermaker couldn't find division line between cladding and steel

H. E. SMITH, Mechanical Engineer
Humble Oil Company, Baytown, Texas
with **GORDON WEYERMULLER,** Associate Editor

Problem: Corrosion in vacuum tower of two-stage pipe still at Humble Oil & Refining Company became apparent several months after it was placed in service in 1938. Still had a steel shell, with cast iron trays and bell caps. Atmospheric tower operated at 600°F maximum temperature and vacuum tower at 750°F maximum.

When corrosive attack was first noted in vacuum tower (26 trays), shell had lost 5/32" in thickness around oil inlet below tray 5. After 11 months, loss had increased to ¼". This corrosion was due to sulfur compounds from sulfur in the crude oil. Temporary repairs were made by gunniting shell with concrete from tray 4 to tray 6, a vertical

Towers on pipe still at Baytown which are protected from corrosion by clad steel

distance of about six feet. After 15 months cement was removed and tower was strip-lined. The 14 gage 410 stainless steel strip lining was installed from bottom, including boot, up to 18th tray.

Strip lining was laborious to install and tended to crack when welded. Although it stopped worst of the corrosion, some seepage occurred which caused corrosion behind lining. However, strip linings have proved to be quite satisfactory in other installations.

In 1941 a second pipe still was placed on stream. In this case a bonded type lining was used in vacuum tower up to 16th tray. This lining, consisting of an inner layer of 410 stainless steel 0.08" thick, was applied to carbon steel plates at steel mill before the plates were formed and welded. This type lining was much better than strip lining. However, after several years it had corroded through in some areas, and cracks had occurred in others. In some instances, voids developed in the steel as a result of corrosion through cracks.

When a 3rd pipe still was built in 1949, operating temperature of the atmospheric tower was increased 50°F. Maximum operating temperature of 650°F was at bottom, decreasing gradually to 250° at top. Higher operating temperature of atmospheric column made it necessary to provide protection for it as well as for the vacuum tower.

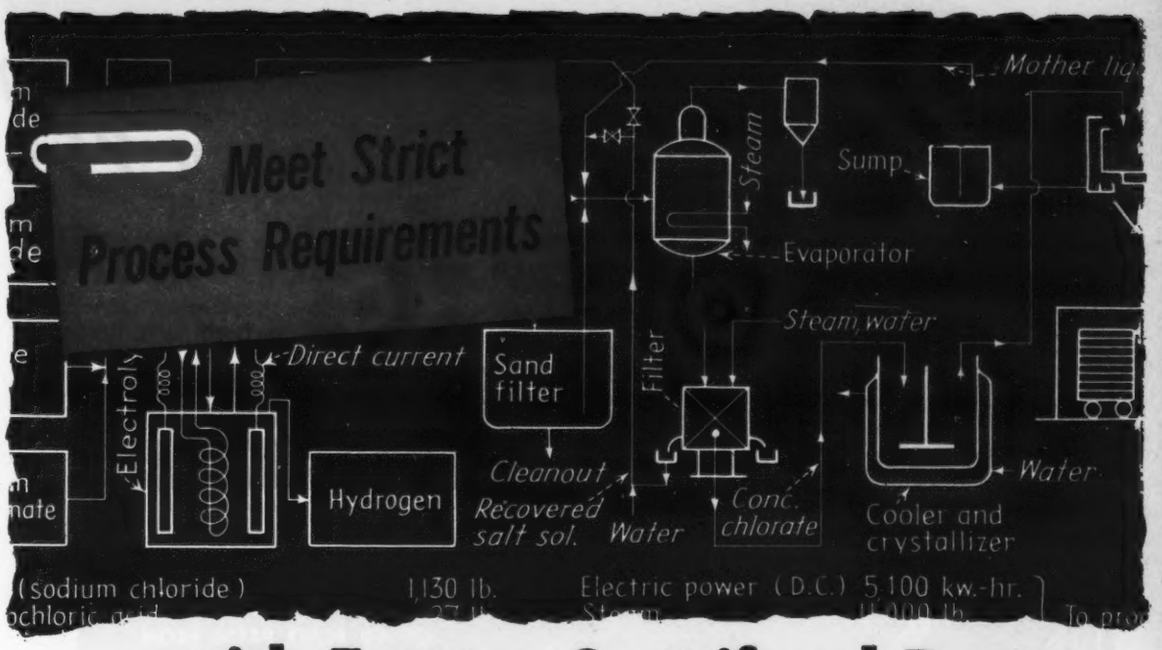
Solution: On third pipe still, plates in atmospheric tower from botom up to between the 8th and 9th trays were constructed of 0.087" thick Type 410 stainless steel cladding on 0.787" thick carbon steel. For upper portion, subject to chloride corrosion, 0.094" thick Monel cladding on 0.531" thick carbon steel was used. This section started from between trays 30 and 31 and continued to top of shell. Monel trays were also used in this section. Top head was gunnited with concrete and bottom head strip-lined with Type 410 stainless.

Bottom section of vacuum tower up to 4th tray was constructed of 0.094" thick Type 410 stainless steel cladding on 0.531" thick carbon steel. From trays 4 to 9, 0.1" of Type 410 stainless steel cladding on 0.9" thick carbon steel was used. In the section from trays 9 to 16 stainless cladding was reduced to 5% of total plate thickness.

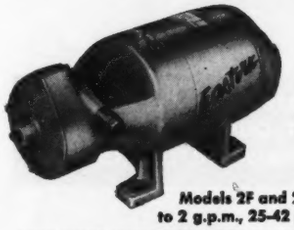
Results: No trouble has been experienced with either atmospheric or vacuum tower of this pipe still during the five years it has been in service. It is expected to provide satisfactory service for a number of years more.

One reason that a further period of excellent service is expected from these towers is that the bonding between the cladding and carbon steel base is so good. An illustration of the good bond between the two metals occurred recently when a boilermaker was cutting the clad steel. Although a

(*Continued on next page*)



. . . with Eastern Centrifugal Pumps

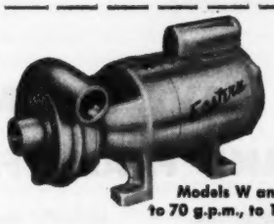


Models 2F and 2J to 2 g.p.m., 25-42 p.s.i.

Model D-11 to 7.5 g.p.m., to 18 p.s.i.

Model F to 17 g.p.m., to 17 p.s.i.

Models U-17 and U-34 to 38 g.p.m., to 21 p.s.i.



Models W and Z to 70 g.p.m., to 11 p.s.i.

Models 3F and 3J to 5 g.p.m., 29-45 p.s.i.

Recent redesign of these close-coupled Centrifugal Pumps has gained tremendous ruggedness and allowed for a wide selection of power requirements. In every detail of size, weight, space requirements, power, and costs, Eastern pumps fill the bill for strict process standards.

Six standard models range from 1/8th to 3/4 H.P., with capacities up to 70 G.P.M., pressures to 65 P.S.I. Eastern Centrifugal Pumps are available in Cast Iron, Bronze, Stainless Steel, Monel, and Hastelloy "C".

Eastern's engineering service offers many special models to meet your specific needs as to capacity and construction. Recommendations entail no obligation, and your inquiries are invited.

NEW EASTERN CATALOG

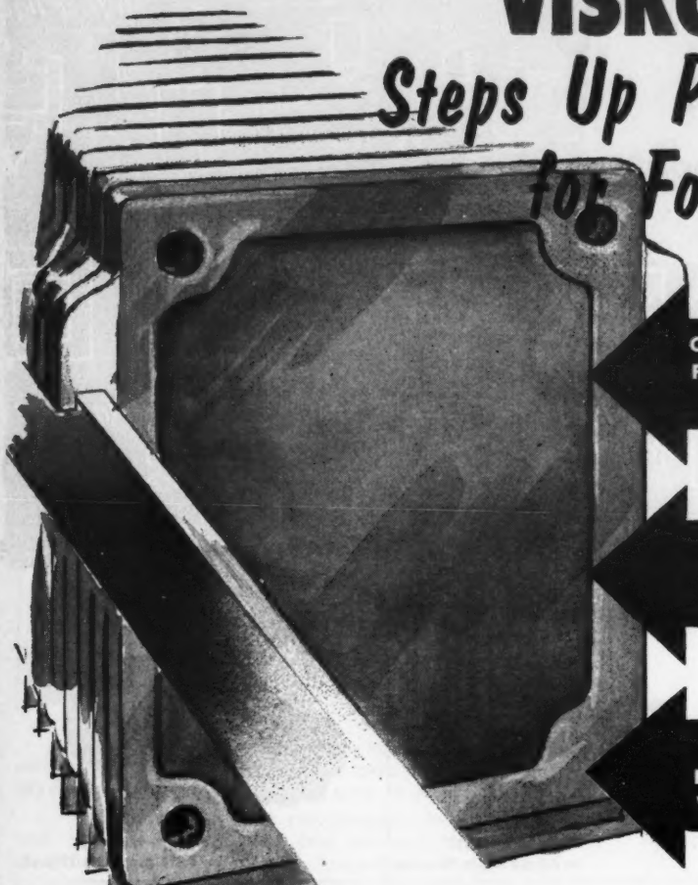
Eastern Centrifugal Pump Catalog contains engineering data, performance charts, diagrams and helpful general information. Request Bulletin 110E.

Eastern

INDUSTRIES, INC.
100 SKIFF ST.
HAMDEN 14, CONN.

When inquiring check CP 6678 opposite last page

VISKON® filter cloth Steps Up Production 25% for Food Processor !



SOURCE: Mr. Raymond Fischer, Fischer Apiaries, North Little Rock, Arkansas

ONLY 15 SECONDS TO REMOVE FILTER CAKE FROM BOTH SIDES OF FILTER FRAME

VISKON CUTS DOWNTIME OF 40 PLATE PRESS FROM ONE HOUR TO 10 MINUTES

FILTRATE MUCH CLEARER, PRODUCT QUALITY INCREASED WITH VISKON FILTER MEDIUM

LET VISKON® SAVE YOU MONEY AND STEP UP YOUR PLATE AND FRAME FILTER EFFICIENCY

VISKON filter cloth lasts longer because of the special bond which protects each nonwoven fiber, yet permits a high degree of flow rate. VISKON has amazing wet strength.

VISKON filter cloth cleans quickly, easily. Frequently the filter cake falls off when plates are released to be cleaned. A low pressure hosing with water usually gets the job done.

VISKON filter cloths are available in 400 basic weights and finishes in cotton and synthetic fibers. They are insoluble in common organic solvents and can be backwashed on line operations.

VISKON filter cloth saves you money! You save on downtime. You save on material cost even when you throw away VISKON filters. Yes, here is a new filter medium to save you money on materials and labor—yet gives you better operating efficiency!

Use This Handy Coupon Or
Dictate Your Inquiry Letter To:

Mr. A. I. Pierce, Filter Media Engineer
THE VISKING CORPORATION
P. O. Box 72 • • North Little Rock, Arkansas

NAME_____
ADDRESS_____
CITY_____ ZONE____ STATE_____
Type of Filter Press_____

VISKON® nonwoven fabrics

When inquiring check CP 6679 opposite last page

(Continued from preceding page)

boilermaker could detect such things much more quickly than the average person, he couldn't find the line of separation between stainless cladding and carbon steel base.

One outstanding advantage of clad steel is its ease of installation since no labor for lining is required at job site. Also, corrosion resistance of stainless steel, Monel, or another alloy can be obtained at a considerable saving by using cladding instead of constructing entire shell thickness from a corrosion-resistant metal.

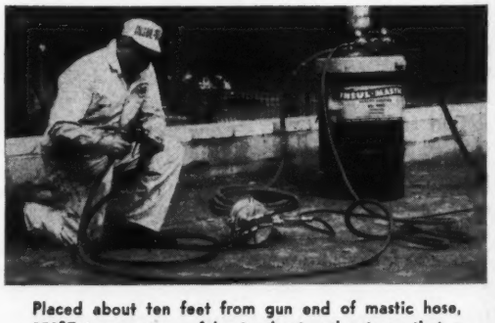
(For further information on clad steel used in pipe still at Humble check CP 6680 on handy form opposite last page.)

(For more solutions to corrosion problems, see section starting on page 76.)

Hot-spray application of mastic provides advantages of speed, solvent savings . . .

drying time for coatings substantially reduced; only one viscosity needed year 'round

As an outgrowth of research directed at finding an easier method of spraying the thin edges of steel beams with mastic coating, Insul-Mastic Corp. of Pittsburgh developed, in cooperation with a heater manufacturer, a hot-spray method that solved their narrow-edge-coating problem and provided extra dividends. In application, heater is attached to mastic hose about ten feet from gun end. As coating material (in the category of cut-back bitumins) passes through the heater, the 250°F temperature raises temperature and pressure of the high-flashpoint solvents so that a percentage of them tend to vaporize when they leave the gun.

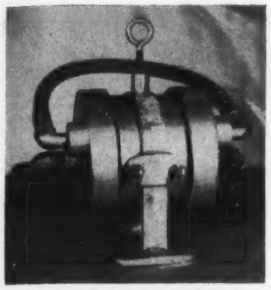


Placed about ten feet from gun end of mastic hose, 250°F temperature of heater heats solvents so that a good percentage of them vaporize after leaving the gun. Temperature at gun is about 165°F

Once free of hose and gun, solvent vapors pass off into air as coating builds up on surface. This reduction of solvent content through pre-heating

appreciably reduces amount of coating shrinkage. Another notable advantage is that drying time for coating has been cut by days due to the freeing of trapped solvents in pre-heating.

Where coating of steel beams is necessary, freer flowing mastic, at low pressure, curls around edges of beams without any special effort from sprayman. These edges, once requiring much care in spraying, now can be coated thoroughly without difficulty. Heated mastic coatings with reduced viscosity also give a much smoother coating surface. This may or may not be an advantage. In the case of insulating mastics, it is desirable to have a rough surface for greater dissipation of heat. For corrosion prevention, however, a smoother surface is more effective.



Heater reduces viscosity of heavy mastic so it can be sprayed under much lower pressure

With the development of the heater, Insul-Mastic has in mind producing a coating of lower solvent content to take advantage of characteristics imparted by the heater to the sprayed mastics. It was also found that one all-weather grade of mastic would suffice for the two — winter and summer — grades formerly stocked.

(Powermastic Heater for hot-spray application of protective coatings is a product of The Spee-Flo Co., Dept. CP, 720 Polk Ave., Houston, Texas . . . or for more information check CP 6681 on handy form opposite last page.)

No maintenance required on feeder as it dispenses H_2SO_4 all day, seven days a week . . .

unit is made entirely of polyvinyl chloride for corrosion resistance

Problem: To feed concentrated sulfuric acid to a flotation circuit, Commercialores, Inc., Clover, S.C., had been using a "home-made" syphon-type feeder which was extremely vulnerable to corrosion from the open tank of acid serving it. To maintain a constant head on the syphon, this mechanism was carried on a float platform in the syphon tank. Syphon itself was first constructed of glass and later of plastic tubing. However, it was also necessary to constrict the discharge end of the tubing to maintain a feed as small as 30 ml/minute.

(*Continued on next page*)

THE "FLEX" IN FLEXITALLIC

Here at Flexitallic Gasket Company we originated the "flex" that is the basic feature of Flexitallic spiral-wound gasket construction. Flexitallic Gaskets are exclusively spiral-wound, the uniquely resilient construction pioneered by the company in 1912. For 43 years our engineers have designed and built only one product — Flexitallic spiral-wound gaskets . . . working with leaders in American industry to make full use of the tremendous sealing power of Flexitallic Gaskets in aviation, atomic research, process industries, power plants, ships of the Navy and merchant marine.

Each Flexitallic Gasket is designed and engineered to meet specific conditions of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally-wound V-crimped plies of required metal with alternating plies of proper filler result in a resilient gasket having characteristics of a calibrated spring.

Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000°F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285". In diameters to 84" O.D.

FLEXITALLIC GASKET CO.
8th & Bailey Sts., Camden 1, N. J.
Representatives in principal cities

Flexitallic®
SPIRAL-WOUND GASKETS
FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

The ideal seal for many process applications is a Flexitallic Gasket with Teflon trapped between edges of stainless steel. Ask for folder, "Teflon in Flexitallic Gaskets."

*Not all spiral-wound gaskets are Flexitallic. Look for *Flexitallic Blue* —it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 6682 opposite last page

Saves DOLLAR As It Solves Dust Problems!

Engineered simplicity of Type N ROTO-CLONE assures highest efficiency— lowest maintenance costs

Why does ROTO-CLONE cost less to maintain? Unique design of Type N achieves the ultimate in simplicity without sacrifice of efficiency. This wet-type collector circulates water without the aid of pumps and nozzles; features entrainment separators requiring little or no attention; has an interior face free of projections, ledges or restricted passages to accumulate collected material and, through re-use of water, cuts operating costs.

Why are space requirements less? ROTO-CLONE provides everything you need, except duct connections, in one complete shop-assembled package—collector, exhauster, motor, drive and dust storage hopper. This compactness makes its relocation easy and economical with change in process, plant layout or production equipment.

Why is performance outstanding? The high cleaning efficiency of this hydro-static precipitator results from the combined action of centrifugal force and through intermixing of water and dust-laden air. Such difficult materials as magnesium dust, buffing dust, lead oxide, lime and abrasive dust are routine assignments for the Type N ROTO-CLONE. What's more, the Type N's compensating water level feature permits maintaining this high cleaning efficiency over a wide range of exhaust volumes. And, with material collected as a sludge or slurry, there's never a secondary dust problem in disposing of the collected material.

Type N Precipitators are available in exhaust volumes up to 50,000 cfm. For complete information, call your local AAF representative, or write direct for Bulletin 277.

Type N ROTO-CLONE Arrangement D designed for continuous sluicing of sludge. Other arrangements are available for either manual removal or continuous disposal of the sludge.

AAF herman nelson

American Air Filter COMPANY, INC.

258 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

When inquiring check CP 6683 opposite last page

(*Continued from preceding page*)

Syphons were difficult to start and there was a tendency for the constriction in the tubing to plug with resultant damage to flotation circuit before trouble was noted. This feeder was used on an ore-processing operation which produces Kyanite, a mineral used in refractory, ceramic industries.

Rigid vinyl feeder used in Kyanite process at Commercialores, Inc., is well-protected against corrosive acid it handles

Solution: In February 1954, Commercialores placed in operation in the Kyanite process a reagent feeder made of rigid polyvinyl chloride. Only motor and nameplate of unit are not molded or machined from vinyl. Top cover is transparent vinyl sheeting so that liquid contents and mechanical workings can be observed. The unit weighs 20 lb, and is about 20" long, 14" high, and 12" wide. Flow rate of liquid to be dispensed from feeder can be adjusted from a few drops a minute to 750 gallons a day.

Results: Since its installation, this plastic reagent feeder has done an excellent job and has required no maintenance. It maintains a very constant feed, dispensing 15 gallons a day around the clock, seven days a week. The unit is well protected from the acid it dispenses, being constructed as it is from corrosion-resistant PVC.

(Reagent Feeder Model E is a product of The Clarkson Co., Dept. CP, 564 Market St., San Francisco 4, Calif. Check CP 6684 opposite last page.)

(Geon rigid vinyl from which feeder is made is a product of B. F. Goodrich Chemical Co., Dept. CP, 324 Rose Bldg., Cleveland 15, Ohio . . . or check CP 6684A opposite last page.)

Processing and Engineering Data starts on page 200

"you can't afford to be without this P. D.* Sanitary Pump in your chemical plant"

Waukesha alone offers you all these

"...it pumps chemicals in solution without turbulence or aeration"	With positive displacement pumping action, you eliminate churning and agitation so damaging to most products. With smooth product flow you reduce your plant processing problems.
"...it's completely corrosion-resistant"	Made from "Waukesha" metal or stainless steel, as required, these pumps are completely corrosion-resistant . . . therefore do not contaminate the product.
"...it's completely sanitary"	Waukesha pumps require a minimum of time to dismantle, clean, and reassemble; they are easy to wash and sterilize; all pump parts are smooth and flush; a 100% sanitary pump.
"...it's dependable and trouble-free"	Careful design and quality construction guarantee a high-performance, long-life pump. This pump with the spring-loaded John Crane rotary seal combination minimizes leakage problems.

The Waukesha positive displacement pump is designed for "tough" pumping jobs in the chemical industry where volatile, corrosive or hot materials of low or high viscosity are being transferred. Waukesha has a P. D. pump to serve you in the chemical, petroleum, petro chemical, textile, pharmaceutical, rubber, and food industries.

• Write for the name of your nearest Waukesha Pump Distributor. Also, consult or write the Waukesha Foundry Company, Dept. 5P, Waukesha, Wis., for complete pump information and recommendations.

*Positive Displacement

Waukesha Foundry Company

When inquiring check CP 6686 opposite last page

Depend on LADISH

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½ inch through 42 inches.

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*Tubular Exchanger Manufacturers Association

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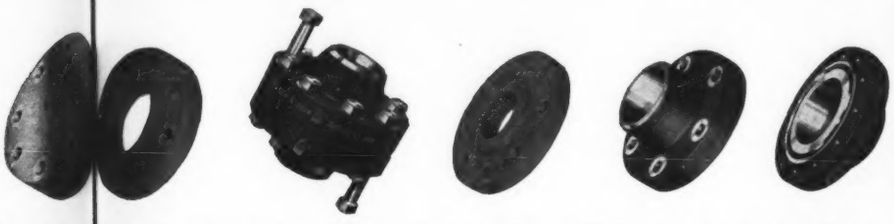

FORGED CORROSION RESISTANT—LIGHT WEIGHT and A.S.A. FLANGES

150 lb. through 2500 lb. pressure ratings.

FORGED SCREWED OR SOCKET WELDING FITTINGS and UNIONS

150 lb. Corrosion Resistant and 2000 lb. through 6000 lb. ratings.

FOR FITTINGS FROM ANY FORGEABLE MATERIAL TO MEET YOUR SERVICE REQUIREMENTS

You get prompt, efficient service when you specify and order from the complete Ladish Controlled Quality line. Fittings *in any forgeable material* in virtually every type, size, wall thickness or pressure rating ... are produced to one uncompromising Controlled Quality standard ... and identified with heat code symbols pioneered by Ladish as verification of metallurgical integrity resulting from exhaustive tests made in the Ladish metallurgical laboratories.

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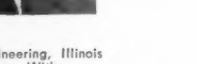

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B.S., Chemical Engineering, University of Kansas. Post-graduate work in journalism, Rutgers and Columbia. Hercules Powder Company, plant control.

A unique editorial philosophy guides Chemical Processing—

. . . *readability of content* is fully as important as the editorial content itself. *Unless an article is read it serves no one.*

. . . to build maximum readership, *of the busy men we manage*, editors must first *take the work out of reading.*

. . . articles must be terse, to-the-point, vital, pertinent to the *job-interests* of readers, adequate in information.

. . . headlines must *inform* quickly what each article is about . . . no vague or "tricky," misleading headlines to waste readers' time.

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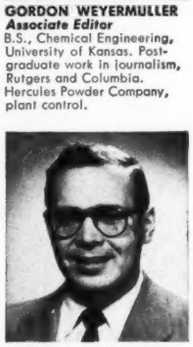

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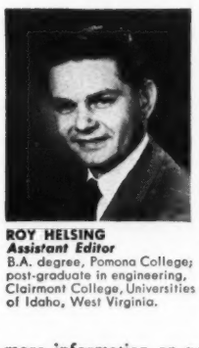

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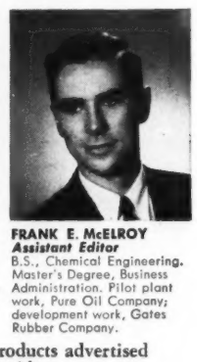

FRANK E. McELROY
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B.S., Chemical Engineering. Master's Degree, Business Administration. Pilot plant work, Pure Oil Company; development work, Gates Rubber Company.

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"Executive Magazines For Industry"

For more information on products advertised by the Ladish Co. on inside two pages specify CP 6687 . . . see information request blank opposite last page.

High-vacuum system uses plug valves . . .

easy to operate, hold pressure at 100-300 microns

Problem: Difficult valving problem was anticipated by Hoffmann-LaRoche, Nutley, New Jersey, when it considered producing thiamine (vitamin B-1) under high vacuum conditions. A batch operation, equipment consists of five fractionating stills, each served by a 4-stage steam ejector. Operating pressure is in 100-300 micron range, at 175-250°F.

Solution: Company equipped each steam ejector and still with a 3" lubricated plug valve. Units also have 1" valves (of same type) as manual relief valves. At the two product draw-off points, there are two block valves and two valves in the relief systems of the same type and size. Design of plug valves is such that critical portions don't contact fluid.

Results: Despite difficult operating conditions, plug valves have given good service. Vacuum is held with no difficulty.

(Lubricated plug valves are product of Rockwell Mfg. Co., Dept. CP, 400 North Lexington Ave., Pittsburgh 8, Pa. . . . or check CP 6685 opp. last page.)

+ + +

THAT'S INTERESTING

Century of progress in pill coating

Not long ago, Norwich Pharmacal Co. donated a 19th Century pill coater to the Smithsonian Institution. This early wonder of the machine age resembles a metal cigar box in size and appearance. It contains a hand-revolved cylinder holding more than 100 inch-long spikes on which pills rested. It could process about 2000 pills a day. In contrast, modern coating pans can process 7,000,000 pills a day.

For more information on product at right, specify CP 6688 . . . see information request blank opposite last page.

CHEELOX B-14

The Balanced Organic Sequestering Agent

Specifically designed to inactivate CALCIUM and MAGNESIUM PLUS all traces of IRON. In alkaline processing liquors, calcium and iron sequestering is accomplished SIMULTANEOUSLY.

CHEELOX B-14 is the new, all-purpose chelating agent which is soluble and stable at all temperatures in neutral, acid and alkaline solutions. For economical control of metal ions, regardless of the problem, Cheelox B-14 is the product to use.

To determine the effectiveness and economy of Cheelox B-14, we suggest you compare this new sequestering agent with the product you are now using.

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Get faster filtration at lower cost *with this new* Niagara

When your process calls for liquid-solids separation by *filtration*, you can do it more economically with the new Niagara Pressure Leaf Filter.

Doubt it? All right . . . just compare your present labor cost and production figures with the time-and-money-saving advantages you could have with a Niagara Horizontal Pressure Leaf Filter. For example:

- **Flow rates are 2 to 5 times greater than with cloth-covered presses.**
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- **A Niagara can be drained, opened, cleaned, closed, filled and precoated . . . by *one* man . . . in a matter of minutes instead of hours.**
- **No cake disposal problem with a Niagara Horizontal Filter. Just tap or shake the leaves and dry cake drops off into hopper for recovery or dry disposal.**
- **Hydraulically-operated quick-opening cover is standard on Niagara Horizontal Filters, saving time and effort for the operator.**
- **Every Niagara Filter is constructed in accordance with ASME requirements. Pressures up to 75 PSI are standard; can be built for pressures up to 1500 PSI.**
- **Because of their simple fabricated design, Niagaras can be made of stainless steel and other corrosion-resistant materials, with rubber or plastic linings, and jacketed or insulated at less cost than you'd think.**

See what we mean? You can really save time and money with this modern equipment. And the same is true of Niagara Vertical Filters. That's the story you'll get from hundreds of users all over the country. For more details, just clip and mail the coupon. No obligation.

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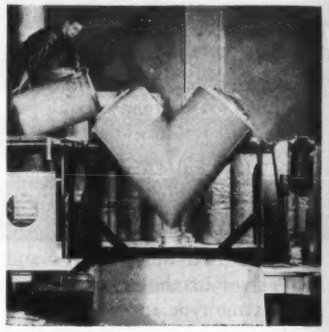
Specialists in Liquid-Solids Separation

NEW SOLUTIONS

Production boosted 35% by twin-shell blender in gelatin plant . . .

reduces labor costs, gives more uniform product

Faced with problems of lagging production and difficult quality control in mixing dry gelatin products, Vyse Gelatin Company, Chicago, Illinois, has switched from



Twin-shell blender in gelatin plant has paid for itself in two years

mechanical mixing to twin-shell blending. Upshot has been more uniform mixing and a production increase of 35%. Bonus saving has been 30% reduction in labor.

In service for over two years, company says that unit has paid for itself. Over 500,000 lb of material have been processed in it. No parts have needed replacement.

Blender has cut mixing time from 30 to 15 minutes. Spread and consistency of mixes are reported to be about as close to perfect as it is possible to get. During blending, unit goes unattended, and operator performs other duties.

Cleaning also no longer presents a problem. Inner surfaces of shells are smooth, easy to keep clean.

(Twin-shell blender is product of Patterson-Kelley Company, Dept. CP, 44 Warren Street, East Stroudsburg, Pa. Check CP 6689 on handy form opposite last page.)

For more information on product at left, specify CP 6690 . . . see information request blank opposite last page.

Refiner in place valve c

Problem and flar unit at Compan Jersey, Preform with, th off duri

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Solution replaced covers. ty Appl operatio

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Results: been tes April 19 perior i upkeep. and stor

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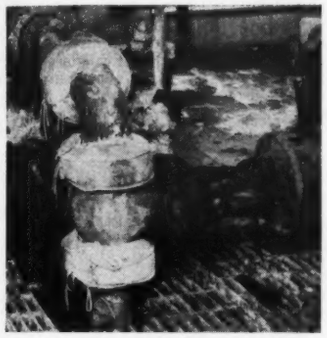
For mor uct at . . . se blank op

Refinery installs fabric in place of all-metal valve covers

Problem: Heavy-metal valve and flange covers on alkylation unit at California Oil Refining Company, Perth Amboy, New Jersey, were bulky and expensive. Preformed and awkward to work with, they had to be cut or burned off during repair work.

Covers are used to protect workers against acid leakage.

Solution: Metal covers were replaced by Dynel synthetic fiber covers. Developed by Mine Safety Appliances Company in cooperation with Carbide and Carbon Chemicals Company, covers conform with contour of valve connections and can be unwrapped, laundered, and reused. They resist acids and caustic and permit complete operating freedom of valves.



Fabric valve and flange covers may be easily removed

Results: Fabric covers have been tested at the refinery since April 1954 and have proved superior in both initial cost and upkeep. Installation, repair work, and storage are easier.

(Chemkovers are product of Mine Safety Appliances Company, Dept. CP, 201 North Braddock Avenue, Pittsburgh 8, Pa. . . . or check CP 6691 opp. last page.)

For more information on product at right, specify CP 6692 . . . see information request blank opposite last page.

Photo courtesy Eli Lilly & Co.

Get faster centrifuging at lower cost *with this new* Tolhurst

When your process calls for liquid-solids separation by *centrifugal force,* you can do it more economically with this new Tolhurst Center-Slung® Centrifugal. Here's why:

- **Center-Slungs can safely handle 3 to 4 times greater out-of-balance loads. This means less time and less care required in loading the basket.**
- **Heavy-duty motor brings basket and load up to speed quickly, cutting extraction time to a minimum.**
- **New design of case bottom provides faster, more complete drainage.**
- **Does your process work better when slurry is heated or refrigerated. Center-Slungs can be jacketed for circulating steam or coolant, at minimum cost.**
- **Center-Slungs can be equipped with hydraulic drive which provides infinitely variable speed centrifuging. This means you can centrifuge many different slurries, each at optimum speed, all in the same machine.**

Tolhurst Center-Slungs are available in 7 sizes, with either perforate or imperforate basket and capacities from one to 17 cubic feet per load. They can be built of steel, stainless steel, monel, steel rubber covered and many other corrosion-resistant materials. They're completely described in an illustrated catalog which is yours for the asking.

FREE CENTRIFUGING SLIDE RULE—There's no charge for this pocket-size slide rule which you can use for quickly calculating centrifugal force. Just mail the coupon.

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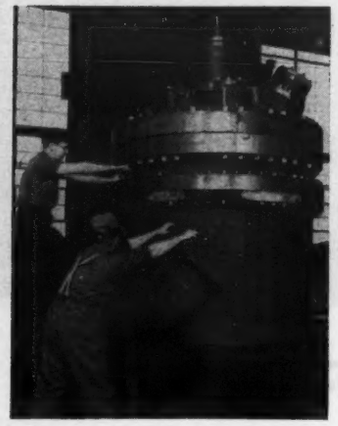
Specialists in Liquid-Solids Separation

Ductile iron autoclave withstands corrosion, has high strength . . .

vessel is used in dye mfg. at Cincinnati Chemical

Problem: Autoclave to be used in the manufacture of an intermediate for dyes in an alkylation process at Cincinnati Chemical Works, Cincinnati, Ohio, had to pass safety code as well as meet requirements for an economical, corrosion-resistant vessel.



This autoclave is probably the first pressure vessel ever fabricated from ductile iron in the US

Cast iron would satisfactorily resist the strongly alkaline material handled. However, the Unfired Pressure Vessel Code of the State of Ohio would not permit use of cast iron for an autoclave at required pressure of 350 psi and temperature of 350°F. This led company to search for a metal that would meet their requirements as well as those of the State.

Solution: In June 1954 a jacketed 600-gal autoclave, weighing 11 tons and made of ductile iron, was placed in service at Cincinnati Chemical. Ductile iron is a cast high-carbon ferrous material, containing magnesium that causes graphite to form spheroids by contrast with cast iron which contains graphite in flake form. This gives ductile iron strength approaching that of steel and good ductility which is completely lacking in cast iron.

PROVEN by 8 years

THOUSANDS of Successful Installations of Farris "4 in 1" Safety Relief Valves*

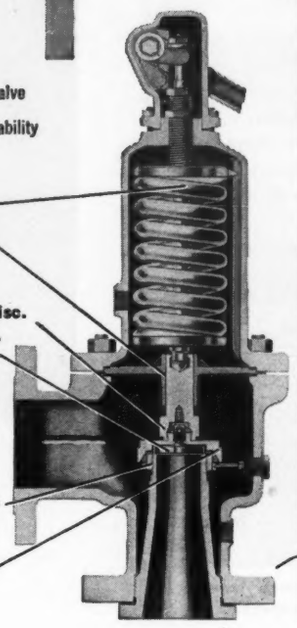
NOTICE: Farris Safety Relief Valves, the Internal Heat Exchanger, and Bellows construction are covered by U. S. Patents and Patents Pending. Copyrights, where applicable, are registered.

1

STANDARD FULL NOZZLE SAFETY RELIEF VALVES

Here is the ultimate in nozzle valve construction with complete standardization and interchangeability in every part:

- Round wire springs calibrated for rating.
- 2½ to 1 guiding ratio, close tolerances.
- Alignment spool for perfect alignment and bearing from stem to disc.
- Self-aligning, optically-flat replaceable disc of forged Stainless Steel.
- All bearings of hardened Stainless Steel.
- Expanded orifices increase capacity.
- Single blowdown ring does not affect capacity —simple adjustment.
- Flared disc-holder for ultimate operating efficiency.



BALANSEAL© SAFETY RELIEF VALVES

BalanSeal construction isolates all working parts. It consists of a neutral area bellows equalling the area of the seating surface, incorporating a mechanically-held seal for the lower part to greatly enhance replacement. BalanSeal can be simply installed any time. Because BalanSeal neutralizes effects of back pressures, resulting in a constant, safe relieving point on the upstream side, size of back pressure piping can be drastically reduced—for pipe savings up to 15 times the cost of the valve! Where accurate set points must be depended upon, BalanSeal stands alone.

For eight years Farris has been setting-the-pace-in-safety with "4-in-1" Safety Relief Valves, the "standard" for long service life, minimum maintenance and positive protection.

Farris' recognition as the pace-setter of the industry is no accident, but the result of many engineering "firsts" in improved valve design—FIRST with balanced bellows construction . . . FIRST to offer multiple nozzle sizes within one valve . . . FIRST with a line of bar stock safety-relief valves for pressures to 10,000 lbs. . . . FIRST to offer internal heat exchangers . . . FIRST to offer realistic pricing, giving the customer the benefit of manufacturing economies . . . and only Farris can point to proved-in-service performance . . . because Farris is the pioneer manufacturer of safety relief valves with bellows.

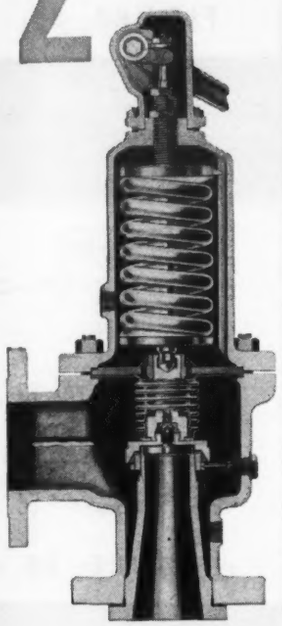
FOR ENGINEERS: Catalog 48Ra on the full line of Farris Safety Relief Valves; and Technical Manual 51B—"Principles of Manifold Discharge Piping". Available on request.

"THE FOX AND THE HARE"

Send for this popular entertaining pamphlet presenting a story about the recognition of BALANSEAL valves. It is humorous and enlightening. Just ask for it by name.

# of ACTUAL SERVICE

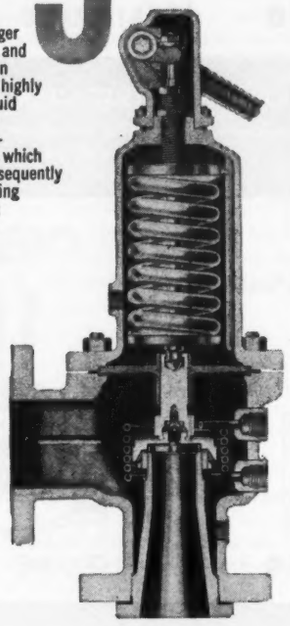
2



INTERNAL HEAT EXCHANGER

3

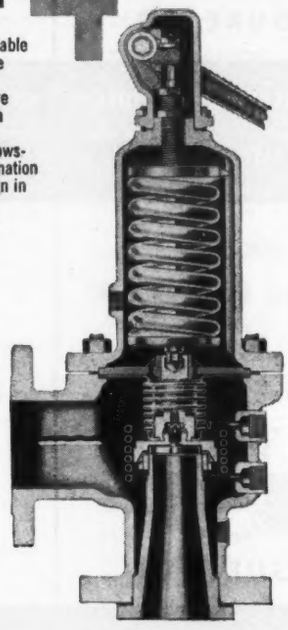
The exclusive Farris Internal Heat Exchanger eliminates inefficient and costly steam tracing in a valve body to keep highly viscous media in a fluid state. It consists of a stainless steel coil inserted in the body to which steam is fed and subsequently trapped out. For placing heat where it is most effective, increasing efficiency, lowering steam consumption, the Farris Internal Heat Exchanger is the only available product of its kind.



BELLOWS—HEAT EXCHANGER COMBINATION

4

For completely dependable valve operation in spite of sticky fluids (tars, asphalt, etc.) and where complete freedom from contamination is required, select the Bellows-Heat Exchanger combination . . . The ultimate design in safety relief valves for applications where material is highly viscous. All parts are Farris Standard construction.



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and Still the Lowest Prices in the industry!

Coming Soon!

An added line of ultimate capacity nozzle valves

Farris **ENGINEERING CORPORATION**

410 COMMERCIAL AVENUE, PALISADES PARK, NEW JERSEY

Affiliates: Farris Flexible Valve Corp. • Farris Stäcon Corp. • Farris HydroTorque Corp. Farris HydroSeal Corp. • Farris Pickering Governor Co.

A test bar trepanned through a 9½" riser on the finished top flange had a tensile strength of 61,580 psi, a yield point of 49,900 psi, and an elongation of 7.1%.

Results: Vessel has sufficient strength and the ability to withstand corrosion so that it is expected to provide many years service. As far as is known, this is the first pressure vessel ever built of ductile iron in the United States. Its use opens up a new field and places a valuable material in the hands of the chemical plant pressure vessel designer.

(Ductile iron used in autoclave is a development of International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. Check CP 6693 opposite last page.)

(Autoclave was built by the Cooper-Bessemer Corp., Dept. CP, Mt. Vernon, Ohio . . . or check CP 6694 opposite last page.)

Army uses ion exchange to remove radioactivity from water

Removal of radioactive contaminants from water by ion exchange slurry is latest method being tested by US Army. Method consists in removing contaminants by addition of commercially available ion exchange resins. Attracted to resins, radioactive ions settle out with them after solution has been agitated.

Tests indicate that under certain conditions the method can make water suitable for drinking purposes within 30 minutes. Batch treatment, although sometimes less efficient, has been found to be faster than the column-type.

(Tests are being conducted by Engineer Research and Development Laboratories, Corps of Engineers, US Army, Fort Belvoir, Va.)

For more information on product at left, specify CP 6695 . . . see information request blank opposite last page.

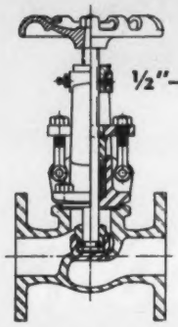


FIGURE **10**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Flanged ends
150 # Service

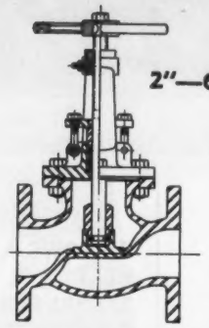


FIGURE **10**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Flanged ends
150 # Service

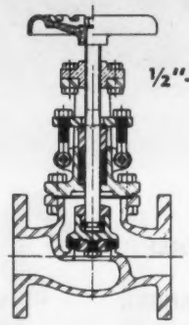


FIGURE **10RD**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Flanged Ends
Renewable Disc • 150 # Service

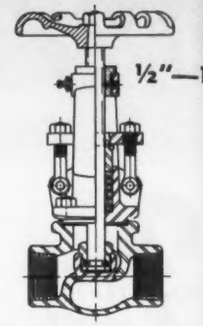


FIGURE **11**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Screwed ends
150 # Service

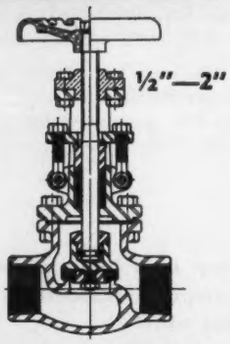


FIGURE **11RD**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Screwed Ends
Renewable Disc • 150 # Service

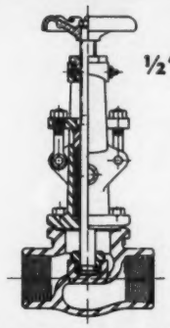


FIGURE **13**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Screwed ends
150 # Service
Designed for Vacuum Application

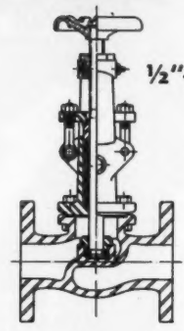


FIGURE **14**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Flanged ends
150 # Service
Designed for Vacuúm Application

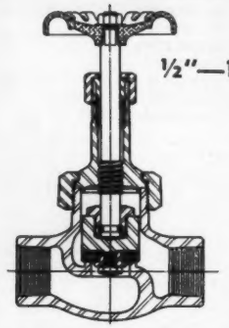


FIGURE **15RD**

INSIDE SCREW RISING STEM
Union Bonnet • Screwed Ends
Renewable Disc • 200 # Service

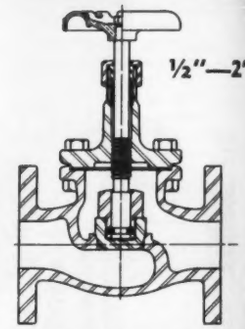


FIGURE **16**

INSIDE SCREW RISING STEM
Bolted Bonnet • Flanged ends
150 # Service

COOPER ALLOY

STAINLESS STEEL

GLOBE VALVES

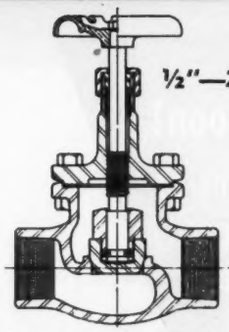


FIGURE **17**

INSIDE SCREW RISING STEM
Bolted Bonnet • Screwed ends
150 # Service

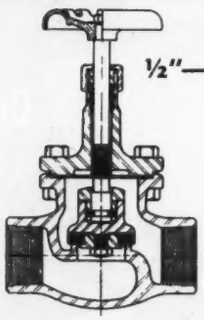


FIGURE **17RD**

INSIDE SCREW RISING STEM
Bolted Bonnet • Screwed Ends
Renewable Disc • 150 # Service

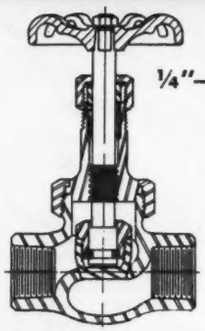


FIGURE **35**

INSIDE SCREW RISING STEM
Union Bonnet • Screwed ends
200 # Service

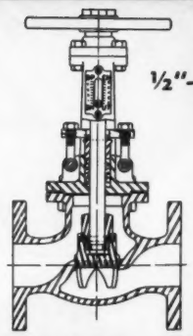
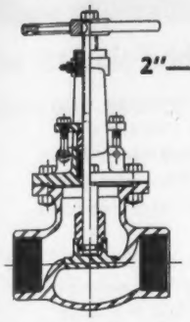


FIGURE **60**

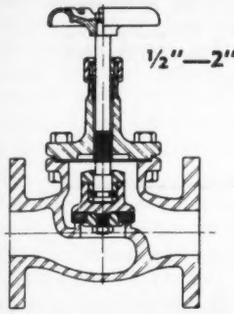
OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Flanged ends
V-Port Disc • 150 # Service



2"—3"

FIGURE **11**

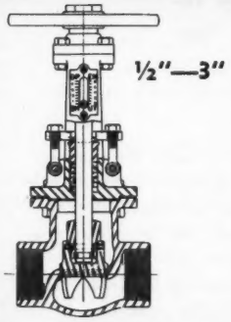
OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Screwed ends
150 # Service



½"—2"

FIGURE **16RD**

INSIDE SCREW RISING STEM
Bolted Bonnet • Flanged Ends
Renewable Disc • 150 # Service



½"—3"

FIGURE **61**

OUTSIDE SCREW & YOKE (OS&Y)
Bolted Bonnet • Screwed Ends
Y-Port Disc • 150 # Service

COOPER ALLOY STAINLESS STEEL **GLOBE VALVES**

● Cooper Alloy globe valves are designed primarily for throttling and close regulation of flow as well as for positive shut-off. Because of their high pressure drop, even when wide open, they should not be used where unrestricted flow is desired. Occasional presence of small amounts of suspended matter can be tolerated. Here are the design features incorporated in the Cooper Alloy valve which make it outstanding for service and reliability.

DESIGN FACTORS

HANDWHEELS: Handwheels are designed to provide maximum ease of operation. Diameters are adequate to provide tight valve closure without the use of wrenches or levers. Small handwheels of the ventilated type incorporate scalloped edges for positive gripping. Larger handwheels are also designed for positive non-slip gripping. All handwheels are rugged and are capable of withstanding hard usage.

YOKE DESIGN: Cooper Alloy outside screw and yoke valves incorporate a bowed yoke construction which provides the flexibility needed to reduce strain on the stem threads; and it is particularly desirable where variations in temperature result in elongation of the stem. This often causes jamming of the operating threads in conventional valves, but it is compensated for in the bowed yoke of Cooper Alloy valves.

STUFFING BOXES: Packing in Cooper Alloy valves is oversized to provide maximum protection against leakage. Square compression is incorporated to provide uniform loading of packing rings. All outside screw type valves incorporate a two piece gland follower and gland flange arrangement which eliminates the possibility of uneven tightening and resultant scoring of the centerless ground stem. Gland flange is secured by means of two stainless steel swinging eye bolts, thus eliminating the possibility of lost bolts and subsequent replacement with bolts not corrosion resistant.

PACKING AND GASKETS: Cooper Alloy valves are normally furnished with blue African asbestos packing and gaskets. Packing is externally finished with mica. Solid molded plastic "V" rings are available on request, as are a variety of specially engineered materials for unusual conditions.

BONNET TO BODY JOINT: Cooper Alloy inside screw type valves are provided with a union type bonnet joint. This construction, which eliminates threads from contact with the product, is very desirable in service where galling, corrosion and product contamination are factors. The bonnet is self-aligning and seating surfaces are made up without rotation, eliminating a serious source of galling. Bolted joints of OS & Y valves are male and female with a retained gasket. This type of joint is desirable because uniform and higher gasket loading, which results in tighter joints, can be accomplished with less bolting than would be required on flat, full face gaskets. Bolting is entirely outside the gasket area eliminating the possibility of corrosion due to hidden leakage through the gasket into the bolt area.

DISC DESIGN: Both design and workmanship are of exceptional importance in all valve discs. Dissimilar angles at the contact between the seat and disc provide line contact. This minimizes the galling potential. Both the seat in the body and the seat on the disc are true and smooth; they are of the swivel type so that the disc is free to locate its own seat.

Designed by valve engineers working in close cooperation with specialists in stainless steel foundry technics, the Cooper Alloy valve is synonomous with top design and top quality. Sold through industrial distributors, mill supply houses, and piping distributors with branches and warehouses in key cities, backed up by a network of regional representatives and a highly trained sales engineering group, Cooper Alloy stainless steel valves and technical service are as near as your telephone. Call or write for catalog.

COOPER ALLOY valves are regularly stocked in the stainless materials shown below.

As the largest producer of corrosion resistant cast alloys Cooper Alloy can provide valves in any of the stainless alloys, as well as in nickel or monel.

ALLOY	APPLICATIONS AND REMARKS
18-8S* **(304)**	General purpose corrosion resistant alloy for applications in chemical, pharmaceutical, textile and food processing industries, and in oil refineries. Carbon is held low for maximum corrosion resistance.
18-8SCb (347)	The addition of columbium permits welding without subsequent heat treatment. Uses are identical to 18-8S, except that it is often specified where field fabrication is required.
18-8SMo* (316)	The molybdenum addition to the 18/8 analysis gives added corrosion resistance in sulfite liquors and many chemicals, reduces pitting corrosion, and helps prevent intergranular type corrosion.
20-29MoCu (FA-20)	An alloy developed primarily for use in hot sulfuric acid of most concentrations. Has superior resistance to 18/8SMo in all media.

*These alloys are available with carbon content held to .03% max. and are recommended in this ELC analysis where heat treatment after welding is difficult or impossible.

COOPER ALLOY
CORPORATION • HILLSIDE, N. J.
Valve & Fitting Division

When inquiring check CP 6697 opposite last page

recovery service saves over 10% of previous solvent costs

supplier credits user for spent pyridine, α-picoline

Problem: Vitamins, Inc., manufacturer of basic vitamin materials in Chicago, requires substantial amounts of pyridine or α-picoline as a solvent and acid-acceptor in one step of the production of Vitamin D_3 from 7-dehydrocholesterol. Water and reaction products are picked up by the solvent, diluting it, and rendering it useless after a time. Diluted solvent had to be batch distilled, an expensive process that tied up production equipment.

Solution: Last year, Vitamins started using Pyridine Recovery Service, typical economics of which are described in accompanying column. Supplier accepts used pyridine and α-picoline (providing it can be purified to original concentration and purity) and in return, credits user with a certain percentage of new solvent cost. This percentage is dependent upon concentration and quantity of solvent that is returned.

In order to determine assay, both user's and supplier's laboratories run analyses on typical samples. Both assays must agree with a specified tolerance. Amount of credit is based upon this, nature of impurities, and volume of shipment.

Results: Savings in solvent costs have averaged over 10% of previous method. Added to this are the somewhat intangible savings due to economies in manpower and equipment that no longer are tied up, and in the convenience of the new setup.

(Pyridine and α-picoline recovery is a service of Coal Chemicals Div., Pittsburgh Coke & Chemical Co., Dept. CP, PO Box 1645, Pittsburgh 30, Pa. . . . or for more information check CP 6698 on handy form opposite last page.)

Direct costs of production of a typical pharmaceutical

	SOLVENT ALTERNATIVES		
	Solvent "X"	Pyridine (without Recovery Service)	Pyridine (with Recovery Service)
Yield of reaction	70%	80%	80%
Direct costs			
Raw materials (500 lb @ $3.10/lb)	$1550	$1550	$1550
Solvent (2500 lb)			
Solvent "X" @ 39¢/lb	975		
Pyridine @ 75¢/lb		1875	1875
Labor	32	32	32
	$2557	$3457	$3457
LESS — Recovery Service credit*			
(2400 lb @ 75¢/lb x 0.50)	-0-	-0-	900
Net effective direct costs	$2557	$3457	$2557
Yield of Pharmaceutical	350 lb	400 lb	400 lb
DIRECT UNIT COST (per lb)	$7.31	$8.64	$6.39

Danger of toxic or otherwise dangerous contaminants being carried through to refined pyridine is eliminated by stringent laboratory control of incoming material

*Assume a 4% loss of pyridine in operation, and Recovery Service credit of 50%, based on analysis of returned solvent, if acceptable.

recovery service economics

Depending upon the application, up to 50%-savings can be realized by recovery service — this warrants a "Second Look" at pyridine

Cleaner separations with purer end-products is the big advantage accruing to use of pyridine as a solvent in pharmaceutical, dyestuff, and fine chemical production. As an acid acceptor, pyridine sets as an extremely mild tertiary base. pH is only 8.5-9.5, and its stability limits side reactions, contributes to good yields. It is also a catalyst for a number of reactions, such as condensation of aldehydes with active hydrogen compounds. But because of its history of relatively high cost, combined with fluctuating availability, pyridine users have been forced to substitute alternative compounds which, although they might give inferior results, were still practicable from an overall price point-of-view.

Today, a plentiful supply at low cost is being made possible by the Recovery Service. For example, let's look at the economics of alternative production of a typical pharmaceutical as shown in the accompanying table.

Many applications seen for itaconic acid from low-cost source

acid and derivatives undergo many reactions, and can condense and cross-link to form useful resins

Uses: Suggested applications include resins, elastomers, VI improvers, paint driers, adhesives, water-resistant glass coatings, photographic paper, moisture-proof cellophane, agricultural chemicals, and pharmaceuticals.

Features: Compound is multi-functional. An unsaturated dibasic acid, it forms carboxylic acid derivatives and exhibits reactions of a compound containing an unhindered double bond.

High mw thermoplastics can be made through poly-condensation reactions. These products are unsaturated and may be converted in a number of ways to thermosetting resins. For example, unsaturated linear polyesters, formed with a glycol or other polyol and the acid, can copolymerize with unsaturated low mw compounds. Using glass cloth or floc filler gives strong structural materials.

The acid upgrades drying oils used in coatings. Itaconic acid cooks have lower viscosities at a given acid number than comparable cooks of fumaric or maleic acids. This slower bodying action makes it possible to add greater quantities of the acid, thereby increasing unsaturation. Accordingly, this alkyd may be cooked with more oil to give superior drying characteristics.

Diesters formed with unsaturated monohydric alcohols homopolymerize to thermoplastic resins, with peroxide catalysts. They copolymerize with other vinyl-type monomers to yield useful, transparent plastics.

Diesters formed with high mw alcohols are suitable plasticizers for PVC-type resins. Tetrahydrofurfuryl and octyl esters are particularly efficient; the former also plasticizes cellulose acetate and ethyl cellulose. Controlled high-temp polymerization of lower itaconic esters yields liquid polymers that plasticize vinyl chloride resins.

Description: Itaconic acid, $C_5H_6O_4$, is produced from a low-cost carbohydrate by fermentation. MP is 165-166°C. Sp gr is 1.63. The white crystalline powder is supplied in fiber board containers. Specs include a 99.0% (min) assay, and not more than 50 ppm heavy metal impurities. Ash is <0.10%, and color (Hazen) is not greater than standard No. 40. Itaconic acid is a relatively mild organic acid and, as tests indicate, presents no more of a health hazard than citric or tartaric acids.

(Itaconic acid is a product of Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y. . . . or check CP 6699 opposite last page.)

A new major organic chemical
Oronite
ISOPHTHALIC
greatly improves quality of surface coatings and polyester resins

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Sodium Sulfonates
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Polybutenes
Phenol
Acetone
Naphthenic Acids
Cresylic Acids
Aliphatic Acid
Phthalic Anhydride
Maleic Anhydride
Para-Xylene 95%
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ORONITE CHEMICAL COMPANY

Household and Industrial Paints, Varnishes, Enamels, Polyesters will all benefit from superior properties contributed by new Oronite Isophthalic.

During the past five years Oronite Isophthalic, produced from a pilot plant, has been thoroughly field tested by a number of major resin producers with outstanding results. Paints and varnishes have shown improved qualities of durability, hardness, water resistance and quicker drying. Tougher, stronger, more heat resistant polyesters have also been produced.

The new Oronite Isophthalic plant is now well under construction with completion date scheduled for October. It will pay you to investigate Oronite Isophthalic *now*.

Technical bulletin and samples!

Contact any Oronite office for technical bulletin giving complete information. Please give name of your company and your job title.

ORONITE CHEMICAL COMPANY

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When inquiring check CP 6700 opposite last page

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*T.M. Reg.

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Plants:
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 6701 opposite last page

Diversified applications seen for alkyl phosphorothioate

Uses: Suggested uses include: additives to extreme pressure lubricants, anti-corrosion agents, anti-foam agents, specialty solvents, hydraulic fluids, and plasticizing agents for cellulose esters, synthetic resins, and GR-S rubber. Compound also can be used as intermediate for organic synthesis.

Features: Alkyl phosphorothioates are chemically somewhat similar to the trialkyl phosphates. However they possess decreased toxicities, greater thermal stabilities, higher boiling points, higher refractive indices and specific gravities, lower water solubilities, and more diversified solubilities in organic solvents.

Compounds are resistant to mild oxidation, but are readily oxidized by strong oxidizing agents, with substitution of an oxygen atom for the sulfur atom. At elevated temperatures, or with suitable catalysts, they may be isomerized similar to the trialkyl phosphites. Semi-polar sulfur is changed to a covalent state and the oxygen from one of the original -OR groups assumes the semi-polar character.

Description: O,O,O-Triethyl phosphorothioate, $(C_2H_5O)_3$ PS, is a clear, colorless liquid with a strong characteristic odor. The semi-polar sulfur atom, which replaces the oxygen of the phosphates, is the sole structural difference.

Boiling point (°C @ 10 mm)	93.5-94
Sp gr (20°/4°C)	1.074
Index of refraction (n_D^{20})	1.4458
Flash point (COC, °F)	225
Viscosity (centistokes @ 100°F)	1.09

Compound is relatively non-toxic; acute oral toxicities to male white rats is 1800 mg/kg body weight. Preliminary tests indicate that handling should not present any health hazards.

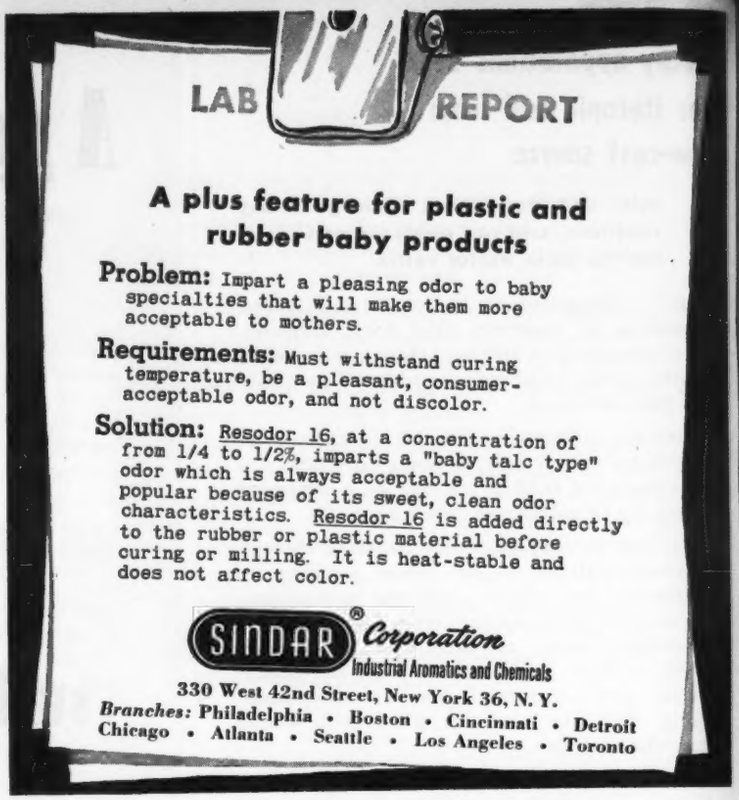
Above compound is available in commercial quantities. Other members of this chemical family now in semi-works production include O,O,O-tributyl phosphorothioate and O,O,O-triisooctyl phosphorothioate.

(Trialkyl phosphorothioates are products of Chemicals Div., Virginia-Carolina Chemical Corp., Dept. CP, 401 E. Main St., Richmond 8, Va. . . . or check CP 6702 opposite last page.)

Lists bulk chemicals

1955 edition of price list and catalog contains description of many bulk chemicals of interest to pharmaceutical, chemical, and dye manufacturers.

"1955 Catalog" is issued by Special Chemicals Div., Winthrop-Stearns Inc., Dept. CP, 1450 Broadway, New York 18, N.Y. When inquiring specify CP 6702A opposite last page.


LAB REPORT
A plus feature for plastic and rubber baby products
Problem: Impart a pleasing odor to baby specialties that will make them more acceptable to mothers.
Requirements: Must withstand curing temperature, be a pleasant, consumer-acceptable odor, and not discolor.
Solution: Resodor 16, at a concentration of from 1/4 to 1/2%, imparts a "baby talc type" odor which is always acceptable and popular because of its sweet, clean odor characteristics. Resodor 16 is added directly to the rubber or plastic material before curing or milling. It is heat-stable and does not affect color.
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When inquiring check CP 6703 opposite last page

To get more information on products—use the Reader Service slip • *opposite last page*

New
low cost quick assembly joint
To Apply: Weld Marman supplied flanges to tube ends and attach by means of Marman coupling.
Reference:
J-41—stainless steel—Food
J-61—stainless steel—Ind.
J-62—cold rolled steel—Auto.
. . . made of stainless steel or cold rolled steel for 1" to 5" o.d. tubing. Model J-41, with a variety of special gaskets, is for use with stainless steel tubing in the food and chemical industries. Models J-61 and J-62 are for applications such as the coupling of exhaust manifolds and exhaust piping joints.
Economy, ease of application and speedy disconnect give this joint wide utility in chemical, oil, automotive, marine and many other industries.
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MARMAN PRODUCTS CO., Inc.
11214 EXPOSITION BLVD.
LOS ANGELES 64, CALIF.

When inquiring check CP 6704 opposite last page

Chlorine dioxide source cannot be exploded, is easily stored

Uses: As a source of chlorine dioxide.

Features: Compound cannot be exploded and can be stored for long periods if temp is kept below 0°F. To use, dissolve in water to make an aqueous solution of known concentration. ClO_2 can be stripped from solution by means of an air stream.

Description: Chlorine dioxide hydrate crystals are packaged in polyethylene containers and maintained at approx. 0°F. $ClO_2.10H_2O$ as supplied is about 1/6 ClO_2 (by wt).

(Chlorine dioxide hydrate is a product of Cardox Corp., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. Check CP 6705 opposite last page.)

Excellent light fastness furnished by stabilized diazonium salt . . .

produces range of pleasing shades of fabrics

Most colors produced with stabilized diazonium salt exhibit very good to excellent fastness to light, washing, soda boil, and other wet processing. Chemical is used to produce a range of pleasing shades, varying from greenish to reddish blue, with various naphthols. Salt can be used for coloring cotton or viscose rayon. Recommended for materials that are to be resin-finished.

(Blue 3BVS salt is product of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or check CP 6706 opposite last page.)

For more information on product at right, specify CP 6707 . . . see information request blank opposite last page.

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The 22nd floor is the new location of our New York sales and executive offices. And it's *your* new headquarters for dependable sales and service on quality WITCO chemicals.

WITCO CHEMICAL COMPANY

WITCO

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Chicago • Boston • Cleveland • Akron • Atlanta • Houston • Los Angeles • San Francisco
London and Manchester, England

Develops modified phenolic adhesive for high-temp, high-humidity uses . . .

great value lies in their weight-saving advantages

Two modified phenolic adhesives give considerable strength and service qualities in high temp and high humidities. NAA Hi-Temp is used for bonding metals and reinforced plastics. CHT, a modification, is used for heat-resistant laminates.

Big value comes in their weight-saving advantage. They also save time and costs, company says. Adhesives were originally developed to meet requirements of supersonic aircraft which develop high skin temp in flight. Numerous potential applications exist in electronic, automotive, and other industries.

In laminating, adhesive is applied only to facing surfaces, not directly to core material. Both top and bottom can be joined in one curing operation.

(Modified phenolic adhesives were developed by North American Aviation, Inc., Los Angeles 45, Calif. Licensees are Rubber & Asbestos Corp., Dept. CP, 225 Belleville Ave., Bloomfield, N.J. and American Latex Products Corp., Dept. CP, 921 Venice, Hawthorne, Calif.)

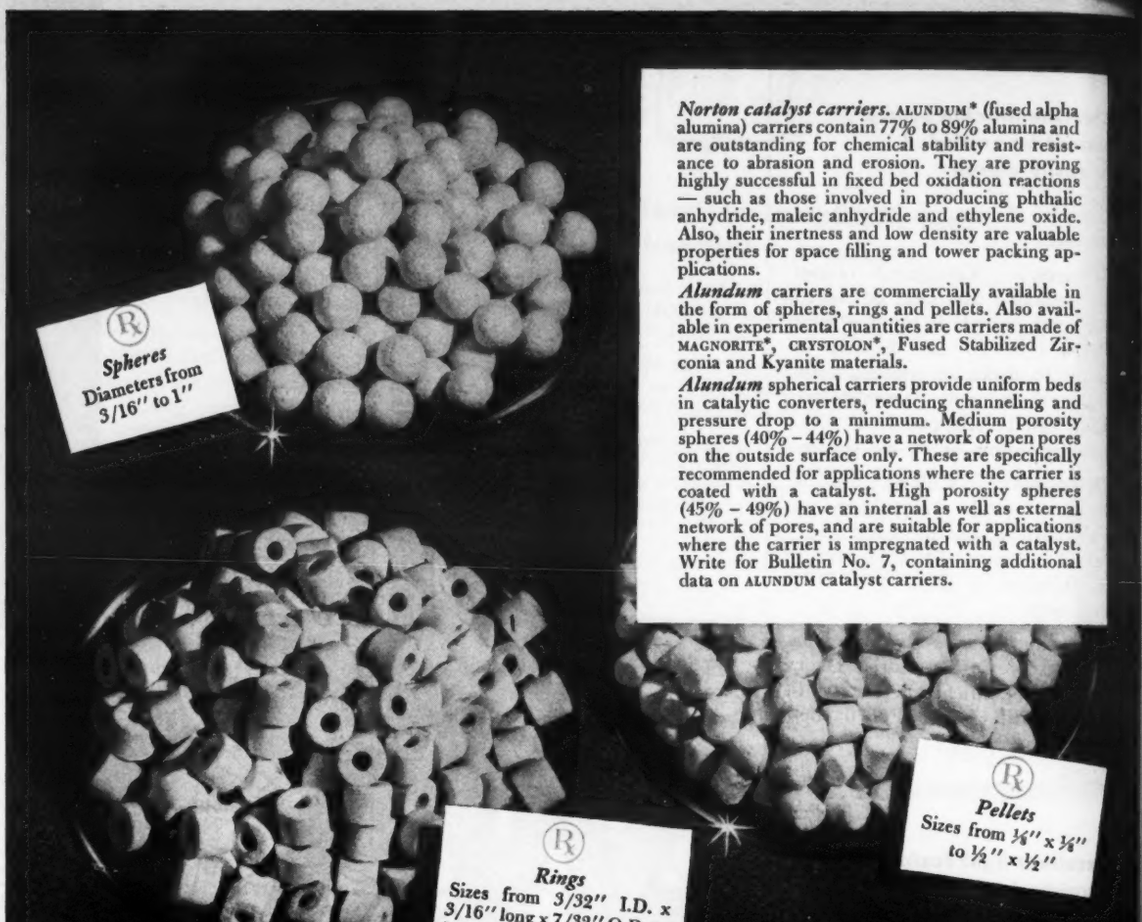
In uniform non-extruded pellet form monochlorotrifluoroethylene resin is readily molded, extruded . . .

formed products have good high-temperature- and excellent chemical-resistance

Uses: Value of this plastic material for special end use such as in electronic wire insulation for high-temp operation, radio tube sockets, printed circuits, valve seats, diaphragms, and gaskets has been explored experimentally and proved successful. Dispersion system for electrical and corrosion barrier coating applications is of interest to chemical processing, electronic, and packaging industries.

Features: Plastics have high-temp- and chemical-resistance. Using conventional thermoplastic molding and extrusion processes, material molds and extrudes easier and faster than similar mw materials, and at lower temp. Coatings as thick as 10 mils have been fused in one application without mud cracking. The primer promotes adhesion on Al, steel, and iron.

Description: Polyfluoron is a uniform non-extruded pellet form of monochlorotrifluoroethylene that has complete absence of fines. It is offered as low-density powder, crystal granules, uniform-



Norton catalyst carriers. ALUNDUM* (fused alpha alumina) carriers contain 77% to 89% alumina and are outstanding for chemical stability and resistance to abrasion and erosion. They are proving highly successful in fixed bed oxidation reactions — such as those involved in producing phthalic anhydride, maleic anhydride and ethylene oxide. Also, their inertness and low density are valuable properties for space filling and tower packing applications.

Alundum carriers are commercially available in the form of spheres, rings and pellets. Also available in experimental quantities are carriers made of MAGNORITE*, CRYSTOLON*, Fused Stabilized Zirconia and Kyanite materials.

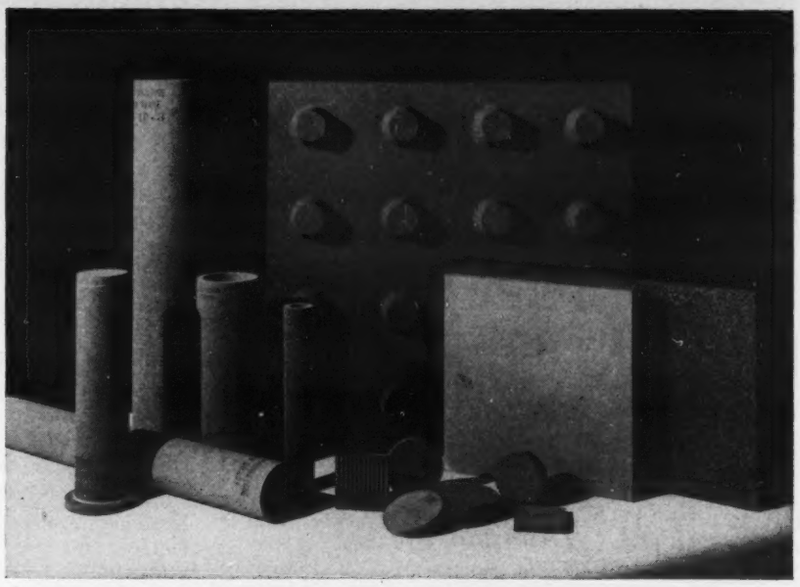
Alundum spherical carriers provide uniform beds in catalytic converters, reducing channeling and pressure drop to a minimum. Medium porosity spheres (40% – 44%) have a network of open pores on the outside surface only. These are specifically recommended for applications where the carrier is coated with a catalyst. High porosity spheres (45% – 49%) have an internal as well as external network of pores, and are suitable for applications where the carrier is impregnated with a catalyst. Write for Bulletin No. 7, containing additional data on ALUNDUM catalyst carriers.

℞ for more profitable processing

Norton engineered and prescribed refractories are proved aids to better, lower cost production

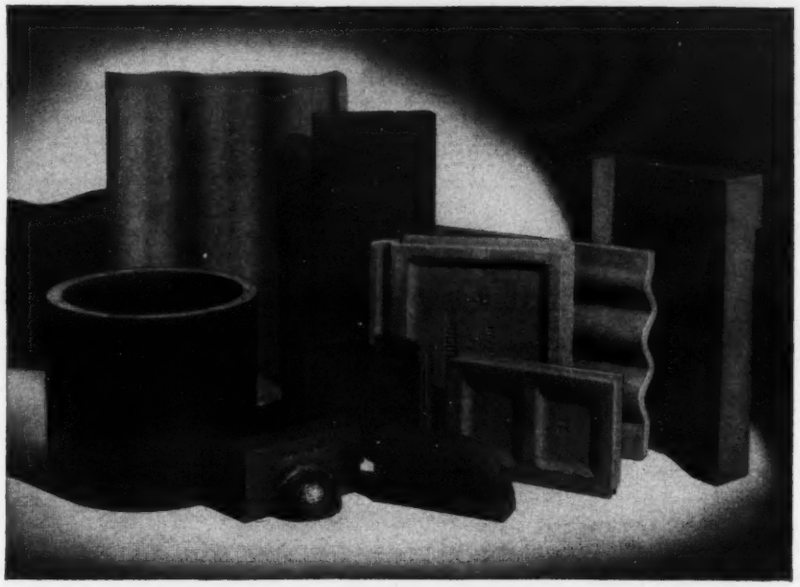
Backed by over 50 years of experience in electrochemical refining, Norton produces refractories whose purity and properties are carefully controlled and consistently duplicated. These refractories are *engineered and prescribed* to give you the best possible ℞ — the most effective combination of physical characteristics, plus thermal, chemical and electrical properties — for your particular applications.

Chemical engineers are finding these ℞'s of immense practical value in widely varying processes. Whatever your own processes may be, it will pay you to learn more about the many advantages of Norton refractories. Just a few products in this complete, top-quality line are described here. For complete details, and expert technical aid, call in your Norton Refractories Engineer. Meanwhile, write direct for the illustrated bulletins, mentioned in this advertisement, that cover your requirements. NORTON COMPANY, 564 New Bond Street, Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Can.



Norton porous mediums come in plates, tubes, discs and diaphragms, engineered to fit your filtering, diffusing or aerating requirements. All have uniform porosity, in the size and open-pore ratio you need. Made of ALUNDUM material that is chemically stable and strong, their resistance both to acid and alkaline conditions gives them extra long life. Norton seamless porous tubes have the advantage, unusual in tubes, of uniform porosity over their entire area — permitting constant air or liquid pressure and enabling uniform backwashing to do more thorough cleaning.

Typical applications are filtering water or solvents; cutting oils, wine and other liquids; reclaiming cleaning fluids; handling industrial oil wastes; chlorination, carbonation and other gas diffusion applications. Bulletin No. 140 tells you more about Norton ALUNDUM porous mediums.



Norton refractory shapes for reaction furnaces come in bricks, plates, tubes and blocks, made of ALUNDUM, CRYSTOLON, MAGNORITE and Fused Stabilized Zirconia refractory materials. The development of Fused Stabilized Zirconia is a typical example of how Norton aids you in utilizing higher temperatures for greater efficiency and output. Norton was the first to bring this valuable material out of the experimental stage into commercial production. Now it is used in many processes.

No other refractory is so chemically stable at such high temperatures under both oxidizing and reducing conditions. In gas synthetic processes, furnaces lined with it have withstood temperatures approaching 4700°F for long periods. Its low thermal conductivity (6.2 BTU in dense shapes at 2000°F) and its high electrical conductivity at high heat are other important properties, all of which are described in Bulletin No. 1741.

Norton electric furnace shapes and laboratory ware

Norton electric furnace refractories — cores, tubes and muffles — are made of ALUNDUM or CRYSTOLON materials. ALUNDUM shapes, composed of 99% pure fused alumina, are characterized by great stability, chemical inertness, excellent thermal conductivity and good electrical insulation qualities. CRYSTOLON shapes, for use under more limited conditions, combine high thermal conductivity with resistance to heat shock. Bulletin No. 458 tells how to construct electrical furnaces for the laboratory.

Norton ALUNDUM laboratory ware, available at your laboratory supply house, offers many properties important to development, experimental or analytical work. It is chemically stable, stands temperatures up to 1900°C and is easy to clean. For filtering, it comes in four degrees of permeability. Bulletin No. 793 gives you the whole story.

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REFRACTORIES
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Making better products . . . to make your products better

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When inquiring check CP 6708 opposite last page

size pellets, and extra-fine Mikro-Atomized form. It is also available as a 40%-solids dispersion, and as a Primer.

It will resist heat up to 400°F and is not affected by caustics, acids, or oxidizing agents. Dimensional stability is maintained from −330° to +374°F. It has good resistivity and power factor values at high temp. Water absorption is zero.

(Polyfluoron resin is distributed by D & R Pilot Plants, Inc., Dept. CP, Hazardville, Conn. . . . or check CP 6709 on handy form which is located opposite last page.)

Extreme stability during storage, processing, and in final film suits latex for many uses . . .

natural rubber latex contains about 73%-solids

Uses: For impregnating textiles and paper, and in compounding adhesives.

Features: Dry rubber film resists deteriorating effect of heat and atmospheric oxygen, as natural antioxidants in the latex are retained during concentration.

Of about 73%-solids content, latex will deposit greater weight of rubber in fewer operations. Viscosity is high, and latex is stable to chemically-active fillers, freezing, solvents, and on storage. Stability to mechanical friction is very great. Premature coagulation, which would hinder penetration, does not take place.

Description: Standard Revertex is a heat-concentrated natural rubber latex, with KOH as the preserving alkali. Viscosity is 1000-3000 cps.

Latex is not coagulated by standard high-speed stirring test, and will hold about 3½-times more dry clay than conventional types.

(Revertex concentrated latex is distributed in U.S. by H.L. Blachford, Inc., Dept. CP, 24 Commerce St., Newark 2, N. J. . . . or for more information check CP 6710 opp. last page.)

Latices for styrene-butadiene paints

Formulating ingredients, paint preparation, mixing of latex paints using a styrene-butadiene copolymer of exceptional stability are given in eight-page bulletin.

"Butaprene Paint Latices — Bul #B-4" is issued by Chemical Sales Div., Firestone Plastics Co., Div. of The Firestone Tire & Rubber Co., Dept. CP, 500 Firestone Blvd., Pottstown, Pa. Specify CP 6711 on handy form opposite last page.

Here's how to solve your

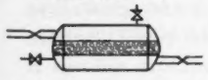
VAPOR PHASE ADSORPTION PROBLEMS

with

Pittsburgh Activated Carbon

TYPICAL BPL APPLICATIONS

Solvent Recovery



Provides proven performance and distinct cost savings in solvent recovery systems.

Gas Purification

Ideal for purification of many chemical and petrochemical gases. Example: Removal of sulfur impurities.

Catalysis

Excellent catalyst and catalyst support in production of vinyl monomers and similar applications.

Hydrocarbon Separation

Ideal for separating higher molecular weight hydrocarbons from gas streams.

Air Purification

Used in industrial air conditioning and purification of air required for aerobic fermentation.

Odor Removal

Used to reduce harmful and odoriferous components in waste gases to minimal concentrations.

PITTSBURGH Type BPL Granular Activated Carbon is specifically designed to solve vapor phase adsorption problems more efficiently and at appreciably lower cost than any other similar material. Made from a selected grade of bituminous coal under rigidly controlled conditions, *Pittsburgh* BPL offers you these important advantages:

1. Controlled pore size.
2. High surface area.
3. High density—high volume activity.
4. Chemical inertness.
5. High thermal stability
6. Range of mesh sizes.

And, due to its unique raw material base, *Pittsburgh* BPL Granular Activated Carbon costs far *less* than other carbons of equivalent performance characteristics.

Write today for samples and full information on prices and specifications of *Pittsburgh* BPL Activated Carbon.

WAD 5613

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When inquiring check CP 6712 opposite last page

Commercial availability announced for highly chemical-resistant easily-compounded elastomer . . .

fluorocarbon polymer can be molded, extruded, formulated into coatings

Uses: For highly chemical-resistant hose, O-rings, tank linings, electrical insulation; corrosion-resistant paints and sealants; and acid-resistant protective clothing.

Features: Extreme oxidation resistance to such compounds as fuming nitric acid, oleum, 90% H_2O_2, ozone, oxygen; weather resistance; thermal stability up to 400°F; chemical resistance to oils at high temp (excluding diester types); and very low moisture absorption are exhibited.

Elastomer can be readily compounded, mixed, molded, and extruded using standard rubber processing equipment.

Description: Kel-F, now commercially available, is a fully-saturated fluorocarbon polymer containing over 50% (wt) fluorine. Methylene groups have been introduced in the chain for elasticity. Physical properties include:

Tensile strength (psi)	2000-3500
Elongation (%)	400-600
Tear strength (ppi)	150-400
Compression set	
@ 77°F (%)	5
@ 212°F (%)	30

Compound can be vulcanized with the organic peroxides, polyisocyanates, polyamines, and isocyanate-amine combinations. It is available as a white spongy crumb or compressed sheets.

(Kel-F fluorocarbon elastomer is a product of M.W. Kellogg Co., sub. of Pullman, Inc., Dept. CP, 225 Broadway, New York 7, N. Y. . . . or for more information check CP 6713 opp. last pg.)

U.S. chemical industry product flow charts

Charts show flow of major organic and inorganic chemicals from raw material to final chemical product and end-use. Three-section chart lists organic chemicals with a production volume in excess of 25 million pounds or $5 million in 1953. Four-section chart shows inorganics with production volume greater than 50 million pounds or $5 million. Charts are well indexed. They are taken from the Chemical Economics Handbook.

To obtain "Product Flow Charts of the U.S. Chemical Industry" remit $5.00 direct to Chemical Economics Section, Stanford Research Institute, Stanford, Calif. When inquiring specify CP 6714 opposite last page.

Study hiding power, color uniformity of polyvinyl acetate paints

Effect of talc upon hiding powder, when used in combination with TiO_2 in polyvinyl acetate paints, is subject of five-page report. Also reported is an investigation of the hiding power, penetration, and color uniformity properties of talc-silica-TiO_2-pigmented PVA paints using a variety of pre-dispersed colors. Three graphs and 1½ pages of formulations are included in the report. Formulations may be used in tint and deep tone bases that show good non-penetration properties, and possess excellent color uniformity over surfaces of varying porosity when tinted with a great variety of colors.

Technical Report No. 30-T is issued by Sierra Talc & Clay Co., Dept. CP, P.O. Box 390, South Pasadena, Calif. Specify CP 6715 opp. last page.

Natural and synthetic gums, resins, waxes, rubbers, and bitumens dissolve in solvent . . .

aromatic solvent is slower evaporating, has higher flash point than xylenes

Uses: As a solvent for natural and synthetic gums, resins, waxes, rubbers, and bitumens.

Features: Material is slower evaporating and has a higher flash point than xylenes. It has excellent solvency characteristics.

Description: Cyclo-Sol 53 is a C_9 aromatic solvent with these typical properties:

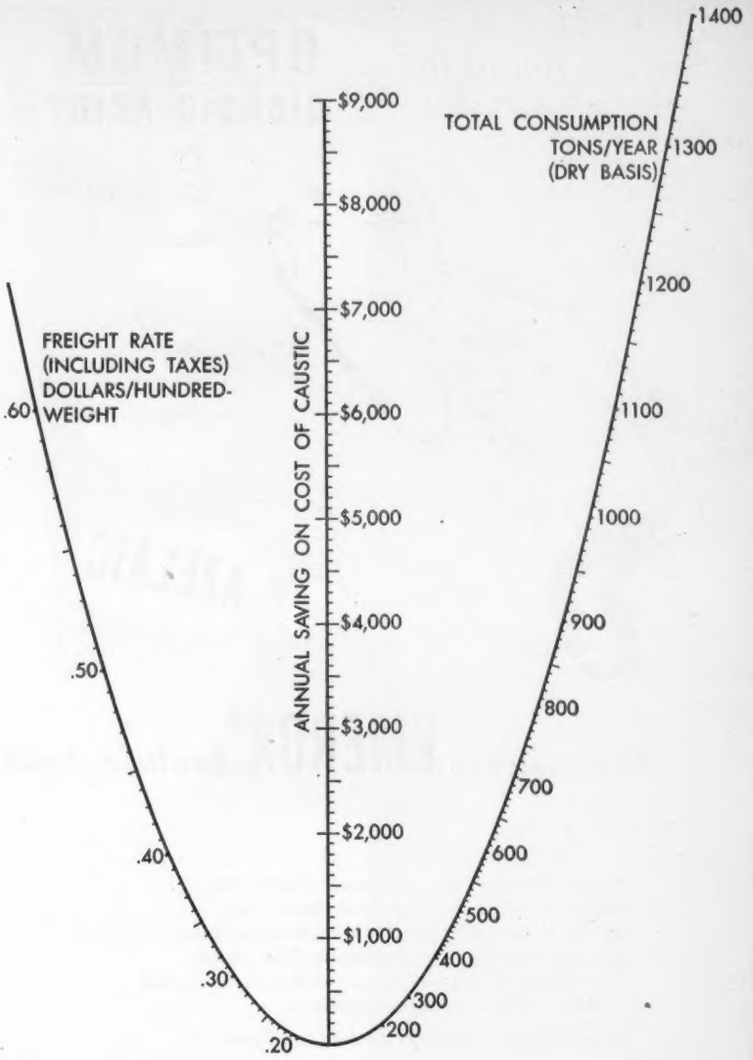
Gravity (degrees API)	30.8
Color (Saybolt)	28
Flash (Tag CC, °F)	122
Aromatics (% vol.)	97
Kauri Butanol Number	97
Mixed Aniline Point (°F)	59
ASTM Distillation (°F)	
IBP	312
50%	322
EP	388

(Aromatic solvent is a product of Shell Oil Co., Dept. CP, 50 W. 50th St., New York 20, N.Y. . . . or check CP 6716 opposite last page.)

Shows use of aluminum silicates in adhesive formulations

Technical bulletin focuses attention on aluminum silicates (ASP's) used in adhesive formulations by the paper-converting industry in manufacture of packaging materials.

Bul No. 301 is issued by Edgar Div., Minerals & Chemicals Corp. of America, Dept. CP, Metuchen, N.J. Specify CP 6717 opposite last page.



Which saves you more...

50% or 73% Caustic Soda?

This nomograph can help you decide Are you using the caustic solution that's least expensive for you? A few seconds' calculation with this nomograph will help you decide.

How to find if you can save on 73% caustic soda Simply draw a line from your freight rate (including taxes) to your annual consumption in tons on a dry basis. Your approximate savings will appear where this line intersects the center line of the nomograph.

This figure represents your savings on freight charges after the $2.00 premium price on 73% caustic soda has been deducted.

From this figure you must deduct a depreciation charge based on the cost of dilution equipment. Your Hooker technical service man is ready to advise you on the equipment needed and its cost.

Double-check your findings this way Before you make a final decision on 50% or 73%, give yourself the advantage of expert technical advice. Let your Hooker technical service man show you what equipment you will need for 73%. He will figure your exact savings—based on a realistic study of your operations.

For quick service, write or phone the nearest Hooker office.

"CAUSTIC SODA BUYER'S GUIDE" is the title of a new pocket-size booklet we'll be glad to send you free. Contains helpful facts on the economics of 50% and 73% solutions; other forms of caustic soda; capacities of tank cars and other containers; useful shipping information. Write us for a copy.

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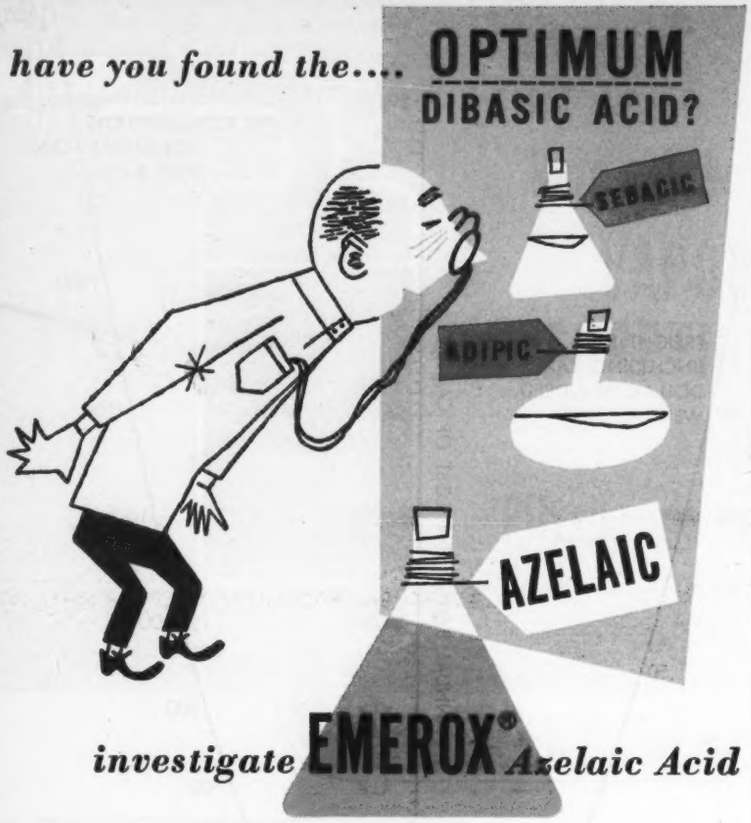
When inquiring check CP 6718 opposite last page

have you found the.... **OPTIMUM DIBASIC ACID?**



investigate **EMEROX®** *Azelaic Acid*

Versus sebacic...For example, in butyl esters for plasticizers, and in dioctyl esters both for plasticizers and synthetic lubricants, these dibasic acids are interchangeable. Yet azelaic has a decided cost advantage with equivalent end-product efficiency and performance.

Versus adipic...Emerox Azelaic Acid produces products with definitely different characteristics. This is exemplified by diesters for plasticizers in which the azelates provide superior low-temperature flexibility and lower volatility. Also, because of its odd carbon structure and longer chain length, azelaic acid imparts unusual properties to resins and polyesters.

Try azelaic acid in your application. It may improve your product's economic or performance standing, either of which can lead to more sales. Mail coupon for literature, or write for sample.

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Emery Industries, Inc.
Dept. CP-5, Carew Tower
Cincinnati 2, Ohio

Please send technical literature on Emerox Azelaic Acid.

Name.....Title.....

Address.....

City.....State.....

When inquiring check CP 6719 opposite last page

MATERIALS

Small quantities of crude rubber synthesized on lab scale

The true molecule of crude (tree-grown) rubber has been synthesized. Made from different materials than those used for GR-S, the rubber possesses physical properties of crude rubber even to tack, stickiness. Only very small quantities have been made to date and these are being further evaluated. It is estimated that even in commercially-important volume, price would be substantially higher than GR-S. The new rubber has not yet been named.

(Discovery was made in the B.F. Goodrich Research Center, Brecksville, Ohio, by a research team assigned to the project by Goodrich-Gulf Chemicals, Inc., Dept. CP, Gulf Building, Pittsburgh 30, Pa.)

Makes nitrocellulose lacquers, polyester and PVC plastics fire-retardant . . .

chloroethyl phosphate has excellent color, can be used in clear, light-tinted coatings

Uses: Nitrocellulose lacquers can be made fire-retardant by inclusion of this compound as plasticizer. Polyester plastics and flexible polyvinyl chloride can also be made fire-retardant and self-extinguishing by this material.

Features: Panel tests show that compound is much more efficient as a flame-retardant than tricresyl phosphate and can even result in self-extinguishing coatings. In addition, low temp properties and UV-light stability are improved over TCP and are equivalent to dibutyl phthalate. Excellent color permits use in clear and light-tinted coatings without detriment.

Lacquers made with compound as plasticizer are intumescent in nature. A thick char affords protection to walls in case of fire.

Description: Celluflex CEF, tris β-chlorethyl phosphate, has these typical characteristics:

Distillation range (°C @ 20 mm)	210-220
Sp gr (20°/20°C)	1.42-1.43
Color (APHA)	10-20
Acid value (mg KOH/gm)	0.01
Pour point (°C)	<55
Flash point (COC, °F)	451
Refractive index (n_D^{20})	1.47-1.48
Viscosity (SUS @ 100°F)	75.9

Compound is completely soluble in polar organic solvents. Water solubility is 0.05%.

(Fire-retardant is a product of Chemical Div., Celanese Corp. of America, Dept. CP, 180 Madison Ave., New York 16, N.Y. . . . or for more information check CP 6720 on handy form opposite last page.)

FOAM'S a FUGITIVE

from DOW CORNING ANTIFOAM AF EMULSION

Given a chance, a Dow Corning silicone defoamer almost always gets its man... restores productive capacity previously wasted on foam . . . reduces processing time . . . eliminates hazardous boil-overs . . . and at very low cost. For example:

- *12 ppm defoam cottonseed oil*
- *4 ppm defoam fermenting wheat*
- *4 ppm defoam neoprene latex*
- *4 ppm defoam paper sizing*
- *.07 ppm defoam vat dies*

The more easily dispersed Antifoam AF Emulsion and its parent product, Antifoam A Compound, are physiologically harmless. Effective at low concentrations against the widest variety of foamers, they pay for themselves many times over.

see for yourself . . .
mail coupon today for free sample

DOW CORNING SILICONES

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Please send me data and free sample of
☐ Dow Corning Antifoam A Compound
or ☐ Dow Corning Antifoam AF *Emulsion*

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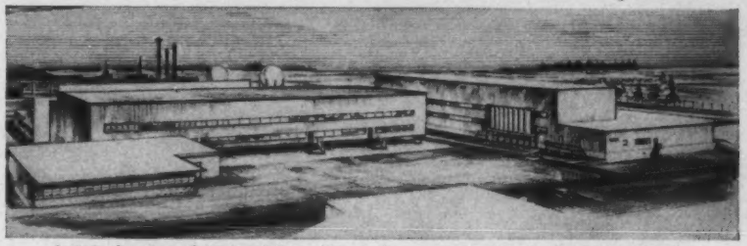
U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

NEW POLYETHYLENE PLANT ON-STREAM

Integrated plant yields resin with consistent, controlled properties; Product to be marketed by U.S.I.'s nationwide sales organization.



Artist's drawing of National Petro-Chemical's new polyethylene plant, Tuscola, Ill.

Two grades of medium flow polyethylene resins are now being produced at a new plant in Tuscola, Illinois, it was announced by National Petro-Chemicals Corporation, and its two parent companies, National Distillers Products Corporation and Panhandle Eastern Pipeline Company. It is estimated that production during the first year of operation will be in excess of 26 million pounds. This plant is the most recent addition to the huge petrochemical facilities owned and operated by Petro at the same plant site. The plant is based on an I.C.I. process, modified by Petro to meet specific requirements of the plastics industry and it produces a high molecular weight polyethylene resin. Because of the integrated nature of the operation, a high-quality polyethylene resin is produced with consistent, controlled physical properties.

To Be Marketed by U.S.I.

Petro's polyethylene resins, under the trademark name "PETROTHENE", are being marketed through the nationwide sales organization of U. S. Industrial Chemicals Co., a Division of National Distillers Products Corporation. "PETROTHENE" resins are available in grades suitable for extrusion, compression, and injection molding, for use in the manufacture of films, bottles, pipe, etc. U.S.I. has sales offices in most major cities and warehousing facilities are being established in East Coast, Midwest and West Coast plastics market areas to assure prompt delivery to customers. "PETROTHENE" molding powder comes in cube form and is available in all quantities from 50 pound bags to carloads.

Made from natural gas

As shown in the flow diagram on the next page, the starting point in the production of "PETROTHENE" resins is natural gas pumped from two converging pipelines by Panhandle Eastern's Tuscola compressor station. Hydrocarbon extraction is the first step. Hydrocarbons are then liquefied under pressure and fractionated into ethane and by-product propane, butane and natural gasoline. The ethane is converted by "cracking" into

MORE

National Distillers Announces 2 Appointments

Dr. Hulse Named Director

National Distillers Products Corporation has recently announced the appointment of Dr. R. E. Hulse as a member of the company's Board of Directors. Dr. Hulse is Vice President in charge of all National's Chemical Activities. This includes the U.S.I. Division which produces and markets industrial alcohol; solvents; chemicals (including metallic sodium, sulfuric acid, anhydrous ammonia); polyethylene; and feed supplements. Dr. Hulse also serves as Vice President and Director of National Petro-Chemicals Corporation, the 60% owned subsidiary managed by National Distillers.

Vincent McCarthy to Direct Polyethylene Sales

In another recent announcement, Mr. Vincent McCarthy was appointed sales manager of "PETROTHENE" Polyethylene Resins for U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation. Mr. McCarthy formerly was sales manager of extruded polyethylene products for Gering Products, Inc. His background embraces the entire thermoplastic raw materials field. Under direction of L. A. Keane, U.S.I. sales Vice President, Mr. McCarthy will supervise all polyethylene sales activities of U.S.I. Division Offices covering all major marketing areas.

SPECIAL NOTICE

Government Permits No Longer Required for Ethyl Acetate

As of January 1, 1955, all restrictions on the use of ethyl acetate have been removed, and denaturation of ethyl acetate no longer will be required. This is in accordance with U. S. Treasury Decision 6117, published in the Federal Register, Volume 19, Number 253, Part 2, Section 1.

This removal of regulations places ethyl acetate in the same category with any other ordinary chemical product, such as acetone, and manufacturers wanting to use or ship ethyl acetate of any grade no longer need obtain government permits and approval to do so.

January 21 marked the dedication of U.S.I.'s new ammonia plant at Tuscola, Ill. A model tank car was presented to Central Illinois Fertilizer Co., to represent delivery by U.S.I. of the first car of anhydrous ammonia for direct application to the soil. Attending the dedication and shown above, left to right, are: John E. Bierwirth, President National Distillers Products Corp.; Dr. R. E. Hulse, National Distillers Vice President and General Manager of National's U.S.I. Division; Dr. K. D. Jacob, U.S.D.A.; D. J. Patterson, U.S.I. Tuscola Plant Manager; C. R. Ware, President, Central Illinois Fertilizer Co.; Fred Jones, Mayor of Tuscola, Ill.

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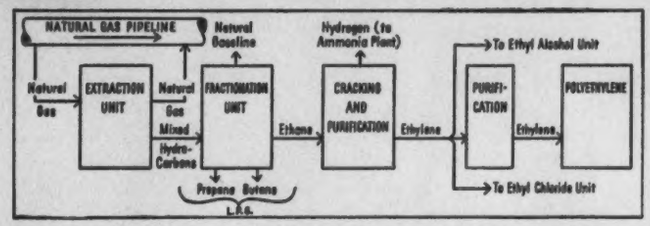
U.S.I. CHEMICAL NEWS

CONTINUED

New Polyethylene Plant On-Stream



"Petrothene" polyethylene resins are made from natural gas as shown in this flow diagram.

ethylene and byproduct hydrogen. The ethylene is purified by low temperature distillation and feeds into the polyethylene unit for conversion into "PETROTHENE" resins.

Capacity can be expanded

According to Dr. Robert E. Hulse, Vice President of Petro, the new unit can be greatly expanded above its current production rate of 26 million pounds of polyethylene. The unit was designed for this future possibility, to insure a steady source of supply to customers in an expanding market.

In addition, the size of the laboratory facilities at Tuscola have been doubled to assist "PETROTHENE" customers with new developments and processing problems, as well as to provide the processing quality control necessary for a high-grade product.

Additional information is contained in the new "PETROTHENE" booklet. Copies sent upon request to Editor, U.S.I. Chemical News.

Methionine Alleviates High Altitude Anoxia

During recent studies, medical researchers found that human beings showed greater resistance to high altitude anoxia (oxygen deficiency) after injections of cysteine — one of the sulfur containing amino acids which can be derived from methionine in the body. Because of its expense and other considerations, cysteine is not used in practical work. However, biologically it can be supplied by administration of its precursor, methionine.

These research findings tend to confirm and add support to the view that cysteine and its precursor, methionine, play a definite and important role in preventing or alleviating the adverse effects of many different stress factors and extremes in environment.

Organosodium Compounds Opening New Frontiers

Organosodium compounds prepared from sodium dispersions are opening new, economical routes to the synthesis of phenylacetic acid, dimethyl phenylmalonate, benzophenone, and many others, including organotin, -phosphorus and -silicon products.

The organosodium compounds are prepared by reacting organic compounds with dispersed sodium. Phenyl sodium, for instance, is made by metering chlorobenzene into the sodium dispersion. The minute particles permit the reaction to start immediately and to produce high yields. Alaphatic, aromatic and heterocylic derivatives can be formed in this manner.

Sodium dispersions are suspensions of microscopic sodium particles (10-20 microns) in various hydrocarbons, such as toluene, xylene or kerosene. High speed agitation is used to disperse the molten sodium in the liquid hydrocarbon. These organosodium compounds can be made in any size vessel from a liter flask to a 1000 gallon reactor.

For detailed information, write for U.S.I.'s Sodium Dispersion Booklet. Free copies on request to Editor, U.S.I. Chemical News.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Many and varied uses are seen for a wide spectrum chemical (ethyl carbamate) with applications ranging from medicine to industry. Reacts with organic or inorganic compounds to form intermediate or end products of commercial importance. **(No. 1080)**

Pressure sensitive adhesive in a ball point dispenser for plant, office, school and home use is now on the market. It is said to bond paper to paper easily, yet make it possible to peel glued sheets apart whenever desired. **(No. 1081)**

Irradiated polyethylene samples for testing can now be bought. Maker reportedly will fill specifications for test lengths of tubes, extruded shapes, or rods. **(No. 1082)**

Seeds get off to fast, healthy starts when planted in hollow-center cubes of plant food material. Ideal for flower, vegetable seeds, these new cubes reportedly make planting, transplanting easier and more successful. **(No. 1083)**

Use of Vaccenic acid, trans-11-oleic acid, with its higher melting point and resistance to rancidity, reportedly will produce new aldehydes, acids, and other compounds of value in food, cosmetic, and industrial applications. **(No. 1084)**

New flexible labels for polyethylene squeeze bottles are said to give with bottle, yet return to its original shape when pressure is released. Applicable with conventional methods and equipment, the new labels are claimed to make possible real color and design in squeeze-bottle packaging. **(No. 1085)**

A "tamed" iodine germicide, that won't stain, sting or poison, is described as effective even in highly dilute solution against a wide range of micro-organisms, including polio virus and influenza virus. **(No. 1086)**

A powerful, completely nonstaining rubber antioxidant, of special interest for white or light-colored goods, shows retention of tensile strength after accelerated aging, the manufacturers state. **(No. 1087)**

To impart fire-retardant properties to latex-base paints, a new borate compound has been developed. **(No. 1088)**

New stabilizer and antiskinning agent for paint has high surface activity reported to keep heavy pigments in suspension. No milling with pigment paste required, just add to finished paint before viscosity adjustment is made. **(No. 1089)**

PRODUCTS OF U.S.I.

ALCOHOLS
Butanol (Normal-Butyl Alcohol)
Fusel Oil — Refined

Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U. S. P., Absolute—200 Proof
Solox*—proprietary solvent—regular and anhydrous

ETHERS
Ethyl Ether, U. S. P.
Ethyl Ether, Absolute—A.C.S.

ACETONE—A.C.S.

ANSOLS
Ansol* M
Ansol* PR

ACETIC ESTERS
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS
Diethyl Oxalate

OTHER ESTERS
Diatol*
Diethyl Carbonate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

FEED PRODUCTS
Calcium Pantothenate (Feed Grade)
Choline Chloride Products
Curbay B-G* 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Vitamin B_{12} and Antibiotic Feed Supplements
Vacatone* 40
Vitamin A, D_2, and K_3 Products

PLASTICS
Petrothene** Polyethylene Resins

OTHER PRODUCTS
Anhydrous Ammonia
Caustic Soda
Ethylene
Liquid Chlorine
Metallic Sodium
DL-Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrogen Solutions
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

*Reg. U.S. Pat. Off.
**Reg. Pend.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers Products Corporation
99 PARK AVENUE, NEW YORK 16, N. Y. BRANCHES IN ALL PRINCIPAL CITIES

Found effective in preventing cracking of GR-S rubber from atmospheric ozone . . .

the heat-stable antiozidant lengthens product life even in dynamic uses

Uses: Additive to prevent cracking in rubber products, especially GR-S.

Features: It has been found to be effective in preventing cracking even in dynamic uses where coating-type antiozidants, such as waxes, fail. Product has also been proved effective in static uses or storage. Compound is heat-stable, important for use in tires or other products subjected to relatively high temp.

Description: UOP 88 is designed to halt surface cracking due to ozone, which problem is becoming more acute, particularly in urban areas. Additive's use in other rubber-like substances is under test.

(Antiozidant is a product of Universal Oil Products, Dept. CP, 30 Algonquin Rd., Des Plaines, Ill. . . . or check CP 6722 opposite last page.)

Good low temperature flex, lower viscosity provided by plasticizer for vinyl

Uses: Plasticizing vinyls, most other resins.

Features: Producing a non-burning film, plasticizer has lower viscosity and better low temperature flexibility than other types of tricresyl phosphate.

Description: Kronitex MX is cresyl phenol phosphate. Supplied as a liquid, it boils at 342°C.

(Plasticizer is a product of Ohio-Apex Div., Food Machinery & Chemical Corp., Nitro, W. Va. . . . or check CP 6723 opposite last page.)

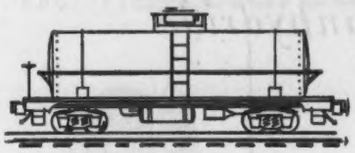
Formulation and use data on resinates

Information about the use of company's resinates as emulsifying agents, detergent additives, dispersents, foaming and flotation agents, viscosity-control agents, and industrial sizing compounds is included in 20-page technical bulletin.

"Dresinate" is issued by the Hercules Powder Co., Dept. CP, 940 Market St., Wilmington 99, Del. Specify CP 6724 opposite last page.

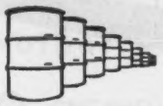
For more information on product at left, specify CP 6725 . . . see information request blank between pages 2 and 3.

AVAILABLE IN



TANK CAR

AND



DRUM QUANTITIES

Du Pont Hytrol® O

Cyclohexanone Solvent

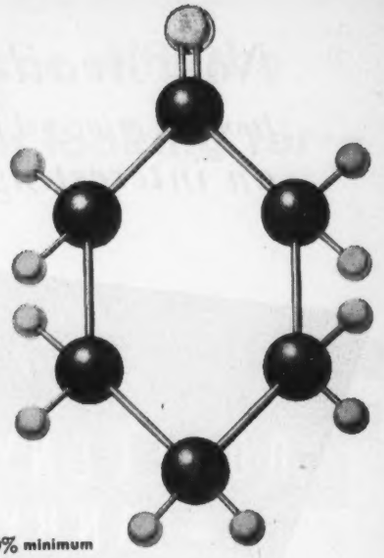
Whether you require one drum or tank car lots, delivery of Du Pont "Hytrol" O is made promptly upon receipt of your order.

"Hytrol" O is shipped as follows:

- **Tank cars—8,000-gallon or 10,000-gallon capacities.**
- **Non-returnable drums, 55-gallon capacity—net weight. 430 lbs.**

Investigate DU PONT HYTROL® O

Cyclohexanone Solvent ($C_6H_{10}O$)



SPECIFICATIONS*

- **Cyclohexanone content.....97.70% minimum**
- **Color, g. $K_2Cr_2O_7$/1.....0.005 maximum**

PROPERTIES

- **Boiling Point at 760 mm.....156.7°C. (314.1°F.)**
- **Specific Gravity 20°/4°C.....0.9478**
- **Flash Point (Open Cup).....129°F. (53.9°C.)**
- **Viscosity: 17.2°C.....2.30 centipoises**
  39°C.....1.55 centipoises
  66.1°C.....1.01 centipoises
- **Evaporation Time (Ether 1).....40.6**
- **Soluble in ether, alcohol and most organic solvents.**
- **Solubility in water decreases with increasing temperature.**
- **Corrosion characteristics: Not corrosive to metals under normal conditions.**

PRINCIPAL USES

FINISHES: Solvent for lacquers, especially those containing nitrocellulose or polyvinyl chloride and its copolymers . . . as a thinner for such lacquers. Prolongs drying period of lacquers.

PLASTICS: Solvent for resins, including polyvinyl chloride and its copolymers and methacrylate ester polymers. An intermediate for cyclohexanone and cyclohexanone-formaldehyde resins. Also used as an active ingredient in vinyl dispersions.

GENERAL ADVANTAGES

Films laid down from Du Pont "Hytrol" O cyclohexanone are easy to dry. This is important where it is desirable that there be no residual solvent to contaminate a packaged product.

At any given viscosity, more concentrated solutions of resin are possible with "Hytrol" O.

In thinner compositions of "Hytrol" O there is less change in viscosity with change in solids contents. Therefore considerable latitude in formulation and application is allowed.

To obtain full information on Du Pont "Hytrol" O, just mail the coupon below, or write us on your letterhead today.

*Partial listing

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Polychemicals

DEPARTMENT

CHEMICALS • PLASTICS

Which of these other chemicals are you interested in?

- ☐ Adipic Acid
- ☐ Crystal Urea
- ☐ Diglycolic Acid
- ☐ HEXALIN® Cyclohexanol
- ☐ Hydroxyacetic Acid
- ☐ LOROL® Fatty Alcohols
- ☐ Methanol

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 585, Wilmington 98, Del.

Please send me full information on Du Pont "Hytrol" O cyclohexanone. I am particularly interested in using "Hytrol" O for the following applications:

Name_____ Position_____

Firm_____

Address_____

City_____ State_____

When inquiring check CP 6726 opposite last page

Now Available

from the principal producer of Succinic Compounds

an interesting alkenylsuccinic anhydride

National

DODECENYLSUCCINIC ANHYDRIDE

$C_{12}H_{23}-HC-C(=O)-O-C(=O)$ with H_2C

Appearance: Light yellow, clear, viscous oil. *Molecular Weight:* 266 *(calculated). Neutral Equivalent:* 131-137. *Viscosity:* See Figure 2. *Specific Gravity:* d_{25}^{25} 1.002. *Flash Point:* 178° C (Cleveland open cup). *Boiling Point:* 180-182° C at 5 mm. Hg. *Infra-red Spectrum:* See Figure 1.

The unusual molecular structure of this bifunctional alkenylsuccinic anhydride, reacting as an unsaturated compound and an acid anhydride, should interest all who work with

- ✔ Alkyd Resins
- ✔ Polyester Resins
- ✔ Plasticizers and Extenders for Resins, Rubber, Paints, Varnishes and Enamels
- ✔ Synthetic Lubricants
- ✔ Lube-Oil Additives
- ✔ Corrosion Preventives for Gasoline, Oils, Waxes, Paints and Varnishes
- ✔ etc., etc., etc.

National Dodecenylsuccinic Anhydride is one more reactive chemical intermediate resulting from National Aniline Research on dicarboxylic anhydrides and related organics. National has ample basic production and many years experience in Succinic Compounds. We invite inquiries from those whose work may lead to substantial additional use.

WRITE FOR TECHNICAL BULLETIN I-8

This 6-page bulletin gives physical properties, chemical reactions, suggested uses and literature references.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

When inquiring check CP 6727 opposite last page

MATERIALS

Information on resins, latices for specialty coatings

Synthetic and dispersion resins and synthetic latices for specialty coatings are subject of 10-page bulletin. Description, formulation, and equipment requirements are included.

"New Ideas for Diversification with Specialty Coatings" is issued by Chemical Div., The Goodyear Tire & Rubber Co., Inc., Dept. CP, 1144 E. Market St., Akron 16, Ohio. When inquiring specify CP 6728 on handy form opposite last page.

Physical, electrical properties of liquid epoxy resin suit it for potting, laminating . . .

cured compounds have good weather-resistance

Uses: For potting and impregnating applications in the electrical industry, and with reinforcing materials for the laminating industry.

Features: Cured resin displays good mechanical and electrical characteristics, good chemical resistance, excellent weather resistance, and very good adhesion to metal and glass.

Description: Araldite 502 is an amber-colored liquid epoxy resin of medium viscosity at room temp. Resin has been modified to increase its resistance to low-temp cracking. The uncured resin has:

Sp gr (23°/23°C)	1.12-1.18
Viscosity (cps @ 23°C)	3000-6000
Epoxy value (eq/100 gm)	0.355-.400
Flash point (COC, °C)	224

Storage life is at least one year when kept in tightly-closed containers in cool, dry place. Cured with recommended hardener, HN-951, for 24 hr @ 40°C, resin has these properties:

Tensile strength (psi)	8000-9000
Compressive strength (psi)	16,000-18,000
Impact strength (Izod, ft lb/in)	0.39
Hardness (Rockwell M)	81-83
Water absorption (% after 24 hr)	0.12-.13
Sp gr (23°/23°C)	1.15-1.20
Dielectric strength (short time, 1/8" section, vpm)	500
Volume resistivity (ohms)	>5.7 x 10^{13}
Dielectric constant @ 60 c	4.11
@ 10^6 c	3.80

As supplied, maximum working temperature is about 70°C. With fillers, this limit can be increased to above 100°C.

(Epoxy resin is a product of Plastics Div., Ciba Company Inc., Dept. CP, 627 Greenwich St., New York 14, N.Y. . . . or for additional information concerning manufacturer's product, reader may simply check CP 6729 on handy form which is located opposite last page.)

Good pigment-wetting properties feature of grinding vehicle for tint systems . . .

can be used in alkyd, water, or oil-base paints

Uses: As a vehicle for a tinting color system in alkyd, water, or oil-base paints.

Features: Since compound is a good pigment-wetting agent and an excellent grinding vehicle, no difficulties are incurred in preparation of tinting colors. It is non-reactive with pigments, and is compatible with almost all paint systems, except PVA, for which it is not recommended. Changes in viscosity are slight when manufacturer's colors are used. Stability is excellent.

Description: Product is a chemically-modified vegetable oil that is compatible with both water and petroleum solvents. Water solutions are clear at 40% solids. At lower solids, oil forms a stable, smooth emulsion. A 25% suspension in distilled water has a pH of 7.5-8.3, with further dilution having little effect. Approximate analysis of the material as supplied:

Solids (%)	80± 1
Color (Gardner, max.)	16
Viscosity	K-R
Acid value	35-40
pH	7.5-7.9
Saponification No.	185-195
Iodine value	105-115
Sp gr	0.970-.975

(Kelsol vehicle for tinting colors is a product of Spencer Kellogg and Sons, Inc., Dept. CP, 98 Delaware Ave., Buffalo 5, N. Y. . . . or for more information check CP 6730 on handy form opposite last page.)

Silicone reference guide

Eight-page reference guide presents information on over 100 silicone products. Application index includes 21 classifications. Tables, graphs, and photos accompany the text.

"1955 Reference Guide" is issued by Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. When inquiring specify CP 6731 on handy form opposite last page.

Want a quick "locator" for specific chemical materials discussed in this issue . . . ?

The alphabetical Product Directory (starting on page 214) will give you a handy page reference to all articles and advertisements.

here it is — the plasticizer with the flame-retardance you've been looking for—

Celluflex* CEF

another product pioneered by Celanese

Celluflex CEF builds exceptional fire-retardancy into a wide variety of plastics and surface coatings—including polyesters, vinyls, cellulosics, polyurethanes—and, in all probability, many other polymers and copolymers.

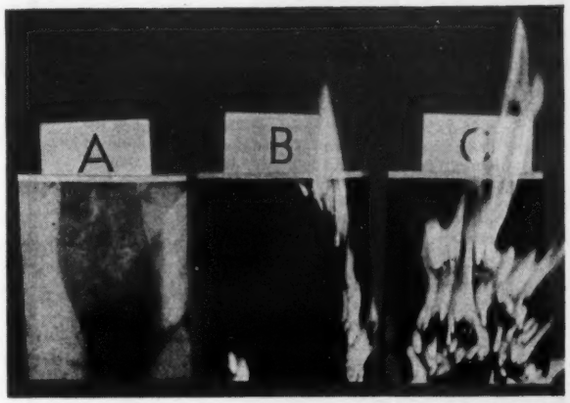
Here, for the first time in commercial quantities, is a plasticizer that provides:

- **flame-retardance and chemical stability**

plus

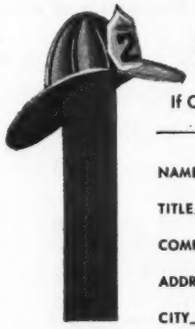
- **excellent low temperature properties . . .**
- **ultraviolet light stability . . .**
- **and a water-white color clear enough for transparent coatings.**

We would like you to examine Celluflex CEF in relation to your application. Use the coupon below for test sample and technical data. Celanese Corporation of America, Chemical Division, Dept. 591-E, 180 Madison Avenue, New York 16, N. Y.



FLAME RETARDANCY TEST. 3 lacquers were formulated using same basic formula with exception of plasticizer. In Case A, it was Celluflex CEF (tris β-chloroethyl phosphate); Case B, tricresyl phosphate; Case C, dibutyl phthalate.

Lacquers were sprayed on panels, then ignited for 7 seconds. Upon removal of flame, Panel B and C continued to burn but Panel A (Celluflex CEF lacquer) extinguished itself within 2 seconds!



Celanese Corporation of America
Chemical Division, Dept. 591-E
180 Madison Avenue, New York 16, N. Y.

CHEMICAL PROGRESS WEEK-MAY 16-21

If Celluflex CEF can be useful in _____
_____ send me test sample and technical literature.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Celanese* CHEMICALS

*Reg. U.S. Pat. Off.

When inquiring check CP 6732 opposite last page

LITHIUM

. . . The Miracle Element

Lithium has made the world its market. To supply that market, Lithium Corporation has assured itself a supply of spodumene ore, the most plentiful and economic lithium raw material, sufficient for years to come. To meet industry's demands for more Lithium products, we are doubling our metal-making capacity and greatly increasing overall production. A new research and development laboratory will continue to develop new and improved uses for Lithium chemicals for the benefit of all industry.

Lithium has found a permanent place in the organic chemical, ceramic, metallurgical, pharmaceutical, grease and atomic energy fields. Lithium is a valuable additive in glassware and pottery, vitamins, welding flux, optical lenses and prisms, cosmetic cream, storage batteries, varnish, candles, bleaches, signal flares and television tubes. Many of its uses were unheard of a year or two ago.

Investigate Lithium's unusual, sometimes paradoxical, often uniquely valuable properties. Research quantities and Data Sheets are available on some 25 different products — metals, salts and special compounds. Write for them.

. . .trends ahead in industrial applications for Lithium

LITHIUM CORPORATION OF AMERICA, INC.
General Offices: Suite A, Rand Tower, Minneapolis 2, Minn.

Mines:

Black Hills, South Dakota; Bessemer City, North Carolina; Manitoba and Quebec.

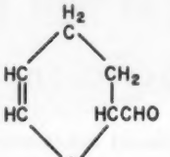
Plants:

St. Louis Park, Minn. and Bessemer City, North Carolina

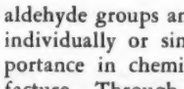
When inquiring check CP 6733 opposite last page

acrolein dimer and derivatives: valuable intermediates commercially available

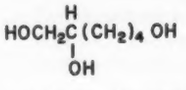
Acrolein dimer is a starting material for making chemical used in textile finishing, paper treating, rubber chemicals, synthetic resins, and pharmaceutical and plasticizer manufacturing.



One of its most useful reactions is hydrolysis to α-hydroxyadipaldehyde, described below. Hydrolysis proceeds readily with a very small amount of catalyst. (In small lab experiments, 0.01% of H_2SO_4 was found sufficient.) Other reactions of this stable, colorless liquid include hydrogenation to tetrahydropyran-2-methanol. The double bond of the dimer reacts with alcohols, phenols, and mercaptans. The aldehyde group reacts with ammonia, amines, and aluminum alcoholates. It may be oxidized using a Ag_2O catalyst. In presence of NaOH, two molecules will form the corresponding diol.

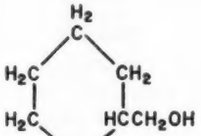


α-Hydroxyadipaldehyde is supplied as a stable 25% aqueous solution. Under proper conditions the two aldehyde groups and the hydroxyl group can react individually or simultaneously. This gives it importance in chemical syntheses and resin manufacture. Through crosslinking, it insolubilizes polyhydric materials such as polyvinyl alcohols and polyvinyl acetal-type compounds, starch and cellulosic materials, and proteins such as casein and animal glues.



Hexanetriol-1,2,6, is comparable to glycerol and the polyethylene glycols as a plasticizer for animal glue and as a softener for casein, zein, and other water-soluble resins. It should be investigated as a moistening agent for cellophane and tobacco, and as a plasticizer for polyamide resins. It may also be useful as a coupling agent and solvent.

With dibasic acids, alkyd-type resins which impart good flexibility and resistance to coatings are yielded. Hexanetriol is suggested as an intermediate for polyurethane resins that impart improved heat resistance and durability to coatings. The triesters with acetic, propionic, and fatty acids should find use as plasticizers.



Tetrahydropyran-2-methanol is of interest in making plasticizers and pharmaceuticals, and as a specialty solvent. It is an intermediate for lysine.

These four compounds are available in commercial quantities. Manufacturer states that care should be exercised in handling.

(Acrolein dimer and derivatives are products of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Co., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 6733A on handy form which is located opposite last page.)

Physical Properties of Acrolein Dimer and Derivatives

	Acrolein dimer	α-Hydroxy-adipaldehyde	Hexanetriol-1,2,6	Tetrahydro-pyran-2-methanol
Molecular weight	112.12	130.14	134.17	116.16
Sp gr (20/20°C)	1.0776	1.066	1.1063	1.0272
Vapor pressure (mm @20°C)	2.8	17	<0.01	0.4
Boiling point (°C @ 760 mm)	150.6	37*	178**	187.0
Freezing point (°C)	<−90	−3.5	<−20	—
Viscosity (cps @ 20°C)	2.2	2.6	2584	11.0
Refractive index (n_D^{20})	1.4645	1.3691	1.4771	1.4581

* @ 50 mm ** @ 5 mm

Serves as lightweight, high-capacity carrier for iron chelates

30/60 mesh vermiculite absorbs own weight, remains free-flowing

Problem: Agricultural chemists at Versenes, Incorporated, Framingham, Massachusetts, found iron chelates to be some of the best compounds yet developed to treat iron deficiency chlorosis in plants, but method of *application* presented a problem. Versene Iron Chelate® (for acid soils) and Versen-Ol Iron Chelate® (see CHEMICAL PROCESSING, March 1955, page 10) quickly surrender the needed iron when drawn in through plant root systems.

As first produced and tested in Florida citrus groves (where iron chlorosis is a constant threat), chelate was a fine dry hygroscopic powder. When applied by conventional spreader methods, there was always a danger of fine, dust-like particles settling on and causing damage to the fruit. Once in the soil, chelates would be quickly leached away by rain. Florida soils are such that leaching is a problem with all types of nutrients, including soluble iron. Chemists realized a carrier was needed if chelates were to be provided in an easy-to-use form, one that posed no special application problems.

Solution: Expanded vermiculite, with a mesh gage of approximately 30/60, was chosen as a carrier as it can absorb low viscosity liquids in proportions equal to its own weight, and still remain free-flowing. Absorptive qualities of vermiculite are due to capillary forces developed in the multicellular platelet structure. Vermiculite has a surface area of 10 to 35 sq m/gm.

Mineral is a hydrated magnesium-aluminum-iron silicate, a close relative to mica. In normal processing, heat at 1800°F converts water in the ore particles to steam, exfoliating them at right angles to the clevage plane. Particle volume is increased about 12-fold.

Results: Original problem has been solved. Chelating agents remain in the soil until needed by the growing plants, and no burning of plants is noted. Low density of vermiculite (12 lb/cu ft) gives products that have high activity per unit weight.

Chelate in carrier can be applied without further mixing, or can be blended with commercial fertilizers. There are no special precautions that must be taken in handling the product, and conventional spreader techniques can be used by the grower.

(Vermiculite is a product of Zonolite Co., Dept. CP, 135 S. LaSalle St., Chicago 3, Ill. . . . or for more information check CP 6734 on handy form opposite last page.)

Buying ETHYL ALCOHOL?

Here's why your best source is

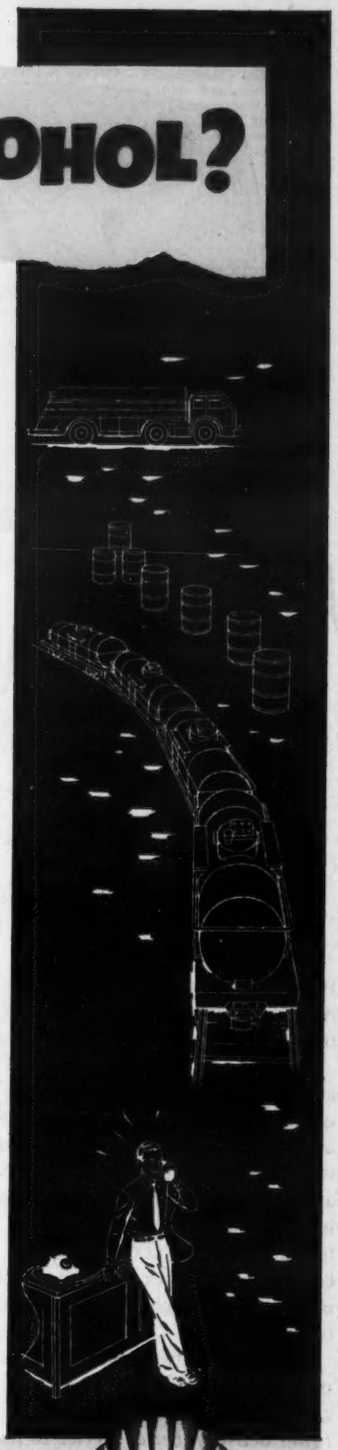
SHELL CHEMICAL

1 **You get extremely pure** alcohol. Meets U.S.P. requirements and is widely used in food and drugs.

2 **Fast delivery is assured** because of denaturing facilities in key locations.

3 **You can save money** through multi-solvent buying in compartment trucks or tank cars.

4 **Available in all major formulations,** including a proprietary solvent.



Whether you buy by the drum or the tank car, you will find that Shell Chemical can supply your ethyl alcohol needs both promptly and efficiently.

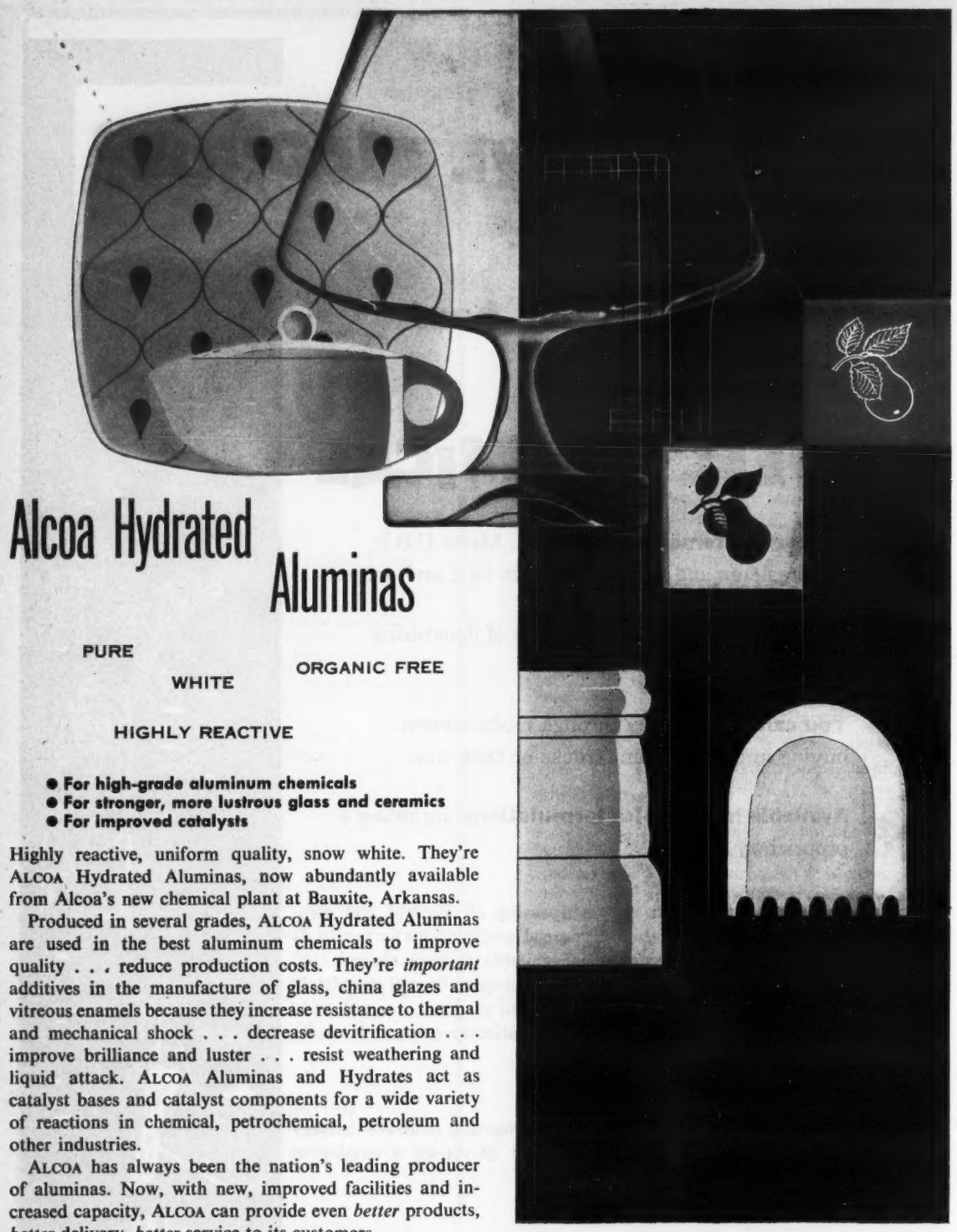
Shell Chemical's ethyl alcohol is of the highest quality, meeting or surpassing all Federal and commercial specifications for purity. It is available as pure alcohol (190 proof), in specially and completely denatured grades . . . as well as in the proprietary solvent, Neosol®.

Write or phone **your nearest Shell Chemical office for delivery information. Send for "Organic Chemicals," SC:54-40, a catalog of solvents, intermediates and resins.**

SHELL CHEMICAL CORPORATION
CHEMICAL PARTNER OF INDUSTRY AND AGRICULTURE
380 Madison Avenue New York 17, New York

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited • Montreal • Toronto • Vancouver

When inquiring check CP 6735 opposite last page



Alcoa Hydrated Aluminas

PURE WHITE ORGANIC FREE

HIGHLY REACTIVE

- **For high-grade aluminum chemicals**
- **For stronger, more lustrous glass and ceramics**
- **For improved catalysts**

Highly reactive, uniform quality, snow white. They're ALCOA Hydrated Aluminas, now abundantly available from Alcoa's new chemical plant at Bauxite, Arkansas.

Produced in several grades, ALCOA Hydrated Aluminas are used in the best aluminum chemicals to improve quality . . . reduce production costs. They're *important* additives in the manufacture of glass, china glazes and vitreous enamels because they increase resistance to thermal and mechanical shock . . . decrease devitrification . . . improve brilliance and luster . . . resist weathering and liquid attack. ALCOA Aluminas and Hydrates act as catalyst bases and catalyst components for a wide variety of reactions in chemical, petrochemical, petroleum and other industries.

ALCOA has always been the nation's leading producer of aluminas. Now, with new, improved facilities and increased capacity, ALCOA can provide even *better* products, *better* delivery, *better* service to its customers.

Now is the time to investigate the possibilities of ALCOA Hydrated Aluminas in your operation. Write today for complete information and free samples. ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-E Alcoa Building, Pittsburgh 19, Pennsylvania.

ALCOA CHEMICALS

ALUMINUM COMPANY OF AMERICA

When inquiring check CP 6736 opposite last page

MATERIALS

Hydroxypivaldehyde in pilot plant quantities

Monomeric form of hydroxypivaldehyde dimerizes spontaneously, but readily depolymerizes during chemical reactions. Produced in pilot plant quantities, compound is supplied as a wet cake. Assay is 90% (min) on dry basis. Max APHA is 200.

(Hydroxypivaldehyde is a product of Eastman Chemical Products Inc., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information check CP 6737 opp. last page.)

Imparts fire-resistant properties to water-base coatings . . .

especially compatible with PVA dispersions

Uses: To provide washable and economical water-base coatings with excellent fire-resistant properties. Other uses are as a pH stabilizer and corrosion inhibitor in water-base coatings, improving fire resistance of paper and textiles, and preventing thixotropic action in aqueous clay dispersions.

Features: Highly soluble, compound is especially compatible with polyvinyl acetate dispersions. Coatings are relatively inexpensive, washable, and meet fire-resistant requirements of Federal Spec. SS-A-118a and Dept. of Commerce Spec CS-42-49 (Class F). The near-neutral pH, at recommended concentrations, offers advantages in aqueous coating systems.

Description: Borotherm is a highly soluble borate composition, having a B_2O_3 content of 57%. A white, finely powdered material, it has a poured bulk density of 55.2 lb/cu ft. Stable, it is free-flowing at normal temperatures and humidities. At 25°C, pH of a 1% solution is 8.55; of a 10% solution, 7.70; and of a 20% solution, 7.31.

(Fire retardant is a product of American Potash & Chemical Co., Dept. CP, 3030 W. Sixth St., Los Angeles 54, Calif. . . . or for more information check CP 6738 opposite last page.)

tert-Alkyl primary amines subject of bulletin

Physical and chemical properties, suggested applications, and chemical reactions of *tert*-butylamine, *tert*-octylamine, and Primenes 81-R, JM-T, and JMA-T are given in 36-page technical bulletin.

Bul SP-33 is issued by Special Products Dept., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. When inquiring specify CP 6739 on handy form opposite last page.

Non-dusting sulfur dyes for cotton and rayon

Sulfur brown CGCF, a non-dusting sulfur dye, produces moderately bright shades of reddish tan on cotton and rayon. It can be dyed in pressure machines, and is practically unaffected by presence of metals in dyebath. Medium depth dyeings on cotton exhibit very good light-fastness, and resistance to washing with soap and soda at 160°F, perspiration, and mercerizing. They have excellent fastness to cross dyeing, dry cleaning, and hot pressing.

Sulfur Direct Blue N produces moderately bright blue and navy shades when applied to cotton or rayon. Dye can be used in iron machines with no dulling. It is suitable for coloring materials to be rubberized or resin finished for crease resistance. Other advantages are similar to Sulfur Brown CGCF, above.

(Non-dusting sulfur dyes are products of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or for more information check CP 6740 on handy form opposite last page.)

Properties unchanged, color improved in meta-phenols for resins, cleaners, driers

Improvement in color of *m*-Phenols 220 has been achieved through special processing. Present product has initial color of less than 2 Gardner, and accelerated aging tests indicate that it will not darken beyond 3 Gardner. Properties have not been changed, except that light-colored material contains only traces of nitrogen bases, which are catalytic and may cause unwanted side-effects.

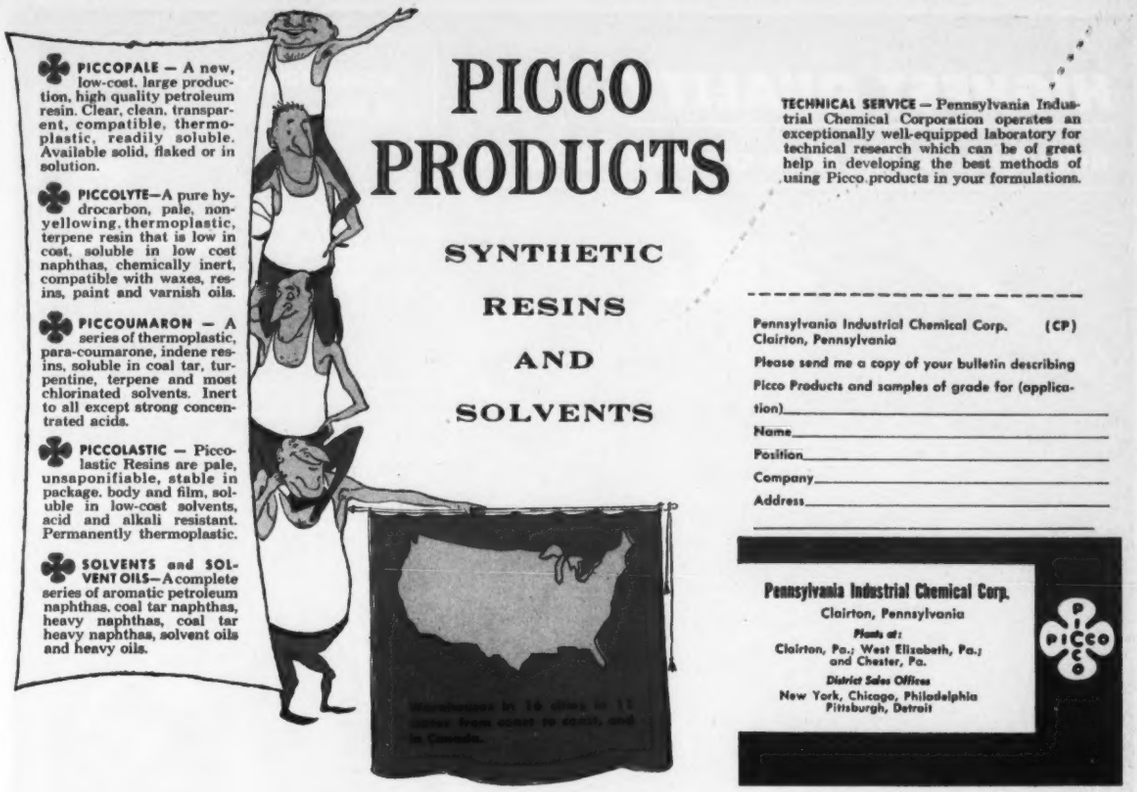
Light-colored *m*-phenols should be of special interest in the manufacture of casting and surface-coating resins, and in preparation of metal cleaners and mercerizing penetrants, and in manufacture of paint driers and vinyl stabilizers

(meta-Phenols 220 are products of Carbide and Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 6741 opposite last page.)

Chemicals listed

Revised catalog alphabetically lists manufacturer's chemicals. The condensed listing is in handy pocket size and contains 40 pages.

"Products of The Dow Chemical Co." is issued by The Dow Chemical Co., 1000 Main St., Midland, Mich. Specify 6742 opposite last page.


PICCOPALE — A new, low-cost, large production, high quality petroleum resin. Clear, clean, transparent, compatible, thermoplastic, readily soluble. Available solid, flaked or in solution.
PICCOLYTE—A pure hydrocarbon, pale, non-yellowing, thermoplastic, terpene resin that is low in cost, soluble in low cost naphthas, chemically inert, compatible with waxes, resins, paint and varnish oils.
PICCOUMARON — A series of thermoplastic, para-coumarone, indene resins, soluble in coal tar, turpentine, terpene and most chlorinated solvents. Inert to all except strong concentrated acids.
PICCOLASTIC — Piccolastic Resins are pale, unsaponifiable, stable in package, body and film, soluble in low-cost solvents, acid and alkali resistant. Permanently thermoplastic.
SOLVENTS and SOLVENT OILS—A complete series of aromatic petroleum naphthas, coal tar naphthas, heavy naphthas, coal tar heavy naphthas, solvent oils and heavy oils.
PICCO PRODUCTS
SYNTHETIC RESINS AND SOLVENTS
TECHNICAL SERVICE — Pennsylvania Industrial Chemical Corporation operates an exceptionally well-equipped laboratory for technical research which can be of great help in developing the best methods of using Picco products in your formulations.
Pennsylvania Industrial Chemical Corp. (CP)
Clairton, Pennsylvania
Please send me a copy of your bulletin describing Picco Products and samples of grade for (application)
Name
Position
Company
Address
Pennsylvania Industrial Chemical Corp.
Clairton, Pennsylvania
Plants at:
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.
District Sales Offices
New York, Chicago, Philadelphia Pittsburgh, Detroit
PICCO
When inquiring check CP 6743 opposite last page

ACETONE
7c PER GALLON
(with Solvent Recovery)

Manufacture of a popular plastic screening material calls for a large amount of solvent. This is usually acetone — highly volatile, and relatively expensive — around 46c per gallon.

To keep production costs low, one firm recovers this solvent — at one-tenth its original cost — with a Barnebey-Cheney Automatic Solvent Recovery System.

Let us demonstrate how you can also cut production costs with Automatic Solvent Recovery.

BARNEBEY-CHENEY Company
CASSADY AT EIGHTH COLUMBUS 19, OHIO
In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec
When inquiring check CP 6744 opposite last page

Get This Informative Free Booklet on New Uses for Straits Tin

New, 20-page booklet tells important story of Straits Tin and its many new uses today. Fully illustrated. Includes sections on new tin alloys, new tin solders, new tin chemicals. Covers tin resources and supply, Malayan mining. Booklet is factual, informative—could well prove profitable to you. Mail coupon now.

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Please send me a copy of your free booklet on new uses for Straits Tin.
Name
Firm Name
Street
City Zone State
When inquiring check CP 6745 opposite last page

Celite Filtration assures perfect clarity—

adds eye appeal and buy appeal to food products

TO GIVE foods and beverages that extra quality which results in more sales appeal, leading processors depend on Celite Filtration. The Celite method provides perfect clarity at high production rates.

Celite Filtration is *efficient*. It removes even the finest suspended solids. Moreover, Celite Filtration is *economical*. It may be used with any type of conventional filter, it is almost automatic, and only unskilled labor is required for routine operation.

And Celite Filtration is *flexible*. To meet your specific requirements, Celite comes in nine standard grades of microscopically controlled particle size. The right balance between degree of clarity and rate of flow may be easily controlled. You can obtain perfect clarity in food products—highest purity in antibiotics—complete removal of insoluble impurities from water, petroleum, chemicals, dry cleaning solvents and many other liquids.

A Johns-Manville Celite Filtration Engineer will gladly discuss the advantages and use of Celite in your product or production process. For his services, without obligation, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

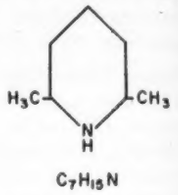
JM PRODUCTS **Johns-Manville CELITE** INDUSTRY'S STANDARD FOR FINEST FILTRATION

When inquiring check CP 6746 opposite last page

Piperidine chemicals are intermediates and solvents

purities are 98% min by titration with acid, using phenol red indicator

High purity piperidine chemicals offer interesting applications as intermediates and solvents. Available on semi-works scale are piperidine ($C_5H_{11}N$), 2-methylpiperidine ($C_6H_{13}N$), and 2,6-dimethylpiperidine (see cut).



$C_7H_{15}N$

2, 6-Dimethylpiperidine

Physical properties of the series include:

	$C_5H_{11}N$	$C_6H_{13}N$	$C_7H_{15}N$
BP (°C @ 760 mm)	106.3	118.2	127.9
Freezing point (°C)	−11.0	−4.2	—
Sp gr (20°/-20°C)	0.8602	0.8401	0.8199
Refractive index (n_D^{20})	1.4525	1.4457	1.4383
Mw	85.15	99.18	113.21

Purities are 98% minimum, by titration with standard acid using phenol red indicator. Pyridine content of piperidine is 1.0% max. Compounds are soluble in water at 20°C in all proportions.

In addition, manufacturer will do custom hydrogenation, to order.

(Piperidine and piperidine chemicals are products of Reilly Tar & Chemical Corp., Dept. CP, 1615 Merchants Bank Bldg., Indianapolis 4, Ind. . . . or check CP 6747 opposite last page.)

Catalogs industrial oil, fatty acid products

All of company's industrial oil and fatty acid products are described and tabulated in eight-page bulletin. Included are detailed specifications, shipping information, and suggested usage on products of animal, vegetable, and marine sources.

Products covered include oleic acids, red oils, stearic acids, glycerines, hydrogenated and sulfonated products and tallow, lard oils and stearines.

Also included are data on specialized products such as defoamers, esters, metal and wool processing oils, and Spermaceti USP.

"Industrial Oils and Fatty Acids" is issued by Industrial Oil Dept. Swift & Company, Dept. CP, 1800 165th St., Hammond, Ind. When inquiring specify CP 6748 on convenient form opposite last page.

Four rare coenzymes made available

Of interest in biochemical research, four rare coenzymes are now available. These are: cytidine-5′-monophosphate (CMP), cytidine - 5′ - diphosphate (CDP), cytidine-5′-triphosphate (CTP), and uridine-5′-diphosphate (UDP).

(Coenzymes are products of Pabst Laboratories, Div. of Pabst Brewing Co., Dept. CP, 1037 W. McKinley Ave., Milwaukee 3, Wis. . . . or for more information check CP 6749 on handy Reader Service slip which is located opposite last page.)

Teflon properties, uses, processing techniques

Unusual combination of properties, uses, and processing techniques of Teflon are covered in 60-page manual, which is illustrated with diagrams, tables, and some photographs. Booklet should be of vital interest to those concerned with the fabrication or use of Teflon.

Bul A-8165 is issued by Polychemicals Dept., E. I. DuPont de Nemours & Co., Inc., Dept. CP, Wilmington 98, Del. When inquiring reader may simply specify CP 6750 on handy form which is located opposite last page.

CHEMICAL PROGRESS WEEK-MAY 16-21

A BETTER AMERICA THROUGH CHEMICAL PROCESS

For more information on product at right, specify CP 6751 . . . see information request blank opposite last page.

FAMOUS LIGHTHOUSES OF AMERICA

MINOT'S LEDGE LIGHT, one of America's most famous wave-swept lighthouses, guards ships against treacherous reefs 6½ miles southwest of the entrance to Boston Harbor. The first tower at Minot's Ledge, an openwork iron pile structure completed in 1850, was toppled into the sea by a great storm in 1851. The second tower, built of interlocking granite blocks and completed in 1860, still stands solidly on the ledge.

A familiar beacon and safe guide to quality in electrochemicals is the name Niagara Alkali Company, long recognized as a leader in this field of chemical production. Depend on Niagara for quality and good service in Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

FOR IMMEDIATE SHIPMENT...

Forerunners of New "A-D-Miracles" in Fatty Alcohol Development . . .

ADOL 54, predominantly cetyl, is a white, amorphous solid at room temperature, bland and dry. Supplied in N.F. quality if desired. Excellent for absorption bases, lotions, creams, pharmaceuticals and softeners.

ADOL 64, stearyl alcohol of exceptional quality. Used in making lube oil viscosity index improvers, pour point depressants, detergents, color dispersants, finishing agents and defoamers. Can be supplied in U.S.P. quality if desired.

ADOL 33, light colored liquid fatty alcohol, a superior low-cloud product for applications such as surface active agents, germicides, insecticides, shampoos, anti-static agents, softeners, lubricating oils, and many other applications where low cold test is important.

ADOL 65, a commercial grade of mixed cetyl and stearyl alcohol is also available for industrial applications.

These and numerous standard ADOLS, immediately available for shipment in car lots or tank cars from eight strategically located warehouses, are forerunners of advanced alcohols under development for manufacture at ADM, Ashtabula, Ohio.

You can keep abreast of what's coming by asking to have your name added to ADM's select list currently receiving advanced technical information on ADOLS and UNADOLS.

Hydrofol PRODUCTS

Hydrogenated and Distilled Fatty Acids and Stearic Acid . . . Hydrogenated Vegetable, Fish, Sperm Oil and Tallow . . . Hydrogenated Castor Oil . . . Stearyl, Cetyl, Oleyl, Alcohol . . . Sperm Oils and Spermaceti . . . Behenic Acid . . . Erucic Acid . . . Hydroxystearic Acid.

ARCHER • DANIELS • MIDLAND COMPANY
Chemical Products Division • 2191 West 110th St. • Cleveland 2, Ohio

When inquiring check CP 6752 opposite last page

MATERIALS

Data on epoxy resins

Reference folder contains miscellaneous technical data on heat-setting and cold-setting epoxy resins for casting, laminating, and coating. Additional data sheets will be supplied for folder, as they become available, to keep it up-to-date.

Reference folder on epoxy resins is issued by Marblette Corp., Dept. CP, 37-21 Thirtieth St., Long Island City 1, N. Y. Specify CP 6753 opposite last page.

Reduces unpleasant side reactions of toxic drugs . . .

polygalacturonic acid is easy, inexpensive to use

Uses: To decrease side reactions of toxic drugs, when the two are chemically combined.

Features: Preliminary investigations indicate that in combination with toxic materials, compound reduces unpleasant side reactions without alteration of desired healing effect. Material is easy and inexpensive to use.

Description: Polygalacturonic acid is derived from orange and lemon pectin.

(Polygalacturonic acid is a product of the Products Dept., Sunkist Growers, Dept. CP, PO Box 2706, Terminal Annex, Los Angeles 54, Calif. Check CP 6754 on handy form opp. last page.)

Textile resins, latices

Special resins and latices which find application in the textile industry are discussed in 12-page booklet. Applications of each are illustrated, described.

"Resins and Latices for the Textile Industry" is issued by Chemical Div., The Goodyear Tire & Rubber Co., Dept. CP, Akron, Ohio. Specify CP 6755 on handy form opposite last page.

FILTROS ...
is Absolutely Unequalled as a CATALYST CARRIER

Strong claim? Yes, but it's supported by the facts. In initial phases of the synthetic rubber program of World War II, a search was made by one of the nation's leading chemical firms for the ideal catalyst for use in acetaldehyde converters. Their conclusions after thorough and impartial tests were:

"FILTROS . . . . best catalyst carrier by a wide margin."

Here are a few reasons for this conclusion:

1. FILTROS is a completely inert medium.
2. Porous tortuous capillary passages give most favorable ratio of surface to volume.
3. Double the efficiency of nearest substitute tested.
4. Ideal as a carrier for catalyst formed in situ by precipitation from solution.
5. 7 grades of porosity available.
6. Longest life, can be reactivated frequently.

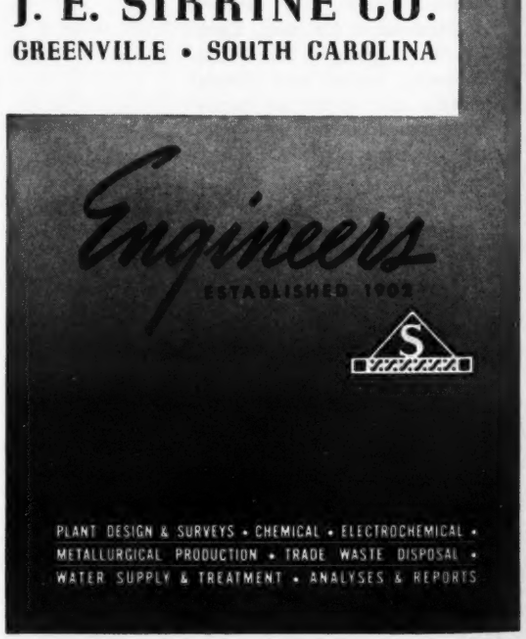
We can supply large quantities, crushed and screened to size. We will welcome a test order, which we will furnish to your specifications promptly. Detailed information on request.

FILTROS

FILTROS INCORPORATED
605 W. Commercial St., East Rochester, N.Y.

When inquiring check CP 6756 opposite last page

J. E. SIRRINE CO.
GREENVILLE • SOUTH CAROLINA


Engineers
ESTABLISHED 1902
PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 6757 opposite last page

Increases solvency, cuts viscosity, and improves blush-resistance of resin-nitrocellulose lacquers

Uses: As a latent ingredient to improve solvency of amyl acetate and cosolvents in resin-nitrocellulose lacquers.

Features: In addition to improving solvency, material reduces viscosity and improves blush-resistance of lacquers.

Description: Pentasol 258 is a higher mw alcohol. IBP is 110°C (min) and FBP is 138°C (max). Water-white, product has these properties:

Sp gr (20°/20°C)	0.80-0.82
Neutralization value (mg KOH/gm)	0.06
Flash point (open cup, °F)	75
Coefficient of expansion (per °C)	0.007

(Pentasol 258 latent solvent is a product of Sharples Chemicals Inc., Sub. of Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. Check CP 6758 opp. last page.)

Polymer/resin combinaton as basis for adhesive formulations gives high shear, permanent flex . . .

improved peel, bend, impact strength, and wetting properties are also gained

Uses: As a basis for adhesive formulations for metals, ceramics, wood, leathers, and rubber.

Features: Adhesives made with the combination possess: 1) greatly improved peel, bend, and impact strength and permanent flexibility; 2) improved low-temp shear strength; 3) high shear strengths with room temp cures; 4) retains strength after immersion in water or many solvents; 5) low shrink during setting; 6) improved wetting properties; 7) fluid mixes without resort to solvents.

Description: Formulations contain four major ingredients: 1) liquid polymer, 2) liquid epoxy resin, 3) amine catalyst, and 4) inert filler. Properties can be varied by changing type and amount of each ingredient.

Depending upon the formulation employed, peel strengths of more than 30 lb/in, bend strengths of about 200 lb/in, and impact strengths of more than 75 lb/in are obtained. With room temp cures, shear strengths of as much as 2500 lb/in develop. Elevated temp cure develops shear strengths as high as 4500 psi.

Thiokol liquid polymers are long chain aliphatic polymers with disulfide links, reactive terminals.

(Thiokol liquid polymer is a product of Thiokol Chemical Corp., Dept. CP, 778 Clinton Ave., Trenton 7, N.J. . . . or for more information check CP 6759 on handy form opp. last page.)

Consistent
High Purity

Ethylene Oxide

There is no requirement set by industry that Nitrogen Division high purity Ethylene Oxide cannot meet or beat.

For your special problems call upon Nitrogen Division technical service. A staff of trained, experienced engineers is available to assist you.

Shipment is made in 3,500 and 10,000-gallon tank cars. Call your nearest Nitrogen Division office and order a trial shipment today.

Anhydrous Ammonia
Ammonia Liquor
Ammonium Sulfate
Sodium Nitrate
Methanol
Urea
Ethanolamines
Ethylene Oxide
Ethylene Glycols
Formaldehyde
Nitrogen Tetroxide
Nitrogen Solutions
U.F. Concentrate—85
Fertilizers & Feed Supplements

NITROGEN DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
Hopewell, Va. • Ironton, Ohio • Orange, Tex. • Omaha, Neb.

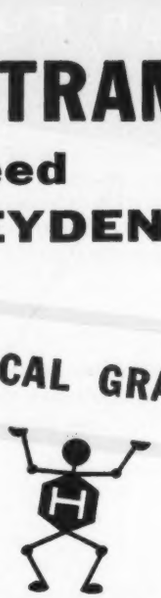
When inquiring check CP 6760 opposite last page

Which "HEXA" helps you most?

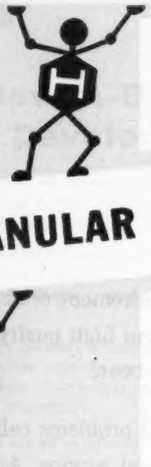
HEXAMETHYLENETETRAMINE

in the FORM you need is available from HEYDEN . . .

TECHNICAL GRANULAR



TECHNICAL POWDER



U.S.P. GRANULAR

U.S.P. POWDER

You can look to Heyden with confidence as your "Headquarters for Hexa". We specialize in producing hexamethylenetetramine in the forms best suited for its many and varied uses. This reactive chemical is important in many industrial fields:

- - as a curing and hardening agent for resins and protein materials.
- - as an accelerator in the rubber industry.
- - as an ingredient in medicinals and solid fuels.
- - as an intermediate for explosives and organic chemicals.
- - as a deactivator for insecticide carriers.
- - in fungicides for citrus fruits.

Heyden's technical staff and sales representatives will be glad to discuss your application and to supply you with samples for testing. Just call the office nearest you.

CONTAINERS

Technical Grade: Multiwall bags, 75 lbs. (granular); 50 lbs. (powder). Fiber drums, 100 lbs.

U.S.P. Grade: Fiber drums, 100, 50 and 25 lbs.

FORMALDEHYDE • PARAFORMALDEHYDE

FINE HEYDEN CHEMICALS

HEYDEN CHEMICAL CORPORATION

342 Madison Avenue • New York 17, N.Y.

CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO

IN CANADA: McARTHUR CHEMICAL CO., LTD. • MONTREAL AND TORONTO

Chemical Progress Week, May 16-21

Binder resins give strength to woodwaste boards . . .

minimize swelling from water, impart no color

Uses: For fabrication of sawdust, wood chips, or other wood aggregates into hardboards.

Features: Two binder resins give good flexural strength and minimum swelling from water absorption. They offer the special advantage of imparting no color to the board.

Description: PDL 1-1970 is an unmodified urea-formaldehyde resin, while PDL 1-1969 is a melamine-urea formaldehyde type. Both provide the advantages of lower cure temp or shorter cure cycle at the same temp, in comparison with other commercially available binders.

(Binder resins are products of Plastics & Resins Div., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. or for more information reader may simply check CP 6761 on handy form opposite last page.)

Slide chart guide to fatty acids

Handy dial-type slide chart carries an unusual amount of information valuable to technical men and users of fatty acids. All one has to do is to set the dial to specific acid and its composition and properties appear on chart.

"Guide to Better Fatty Acids" is issued by Wilson-Martin Div., Wilson & Co., Dept. CP, Snyder Ave. and Swanson St., Philadelphia, Pa. When inquiring specify CP 6762 on handy form opposite last page.

For more information on product at left, specify CP 6763 . . . see information request blank opposite last page.

Freeze-stable exterior white emulsion paint formulation gives good adhesion

A formula for making freeze-stable, exterior white emulsion paint gives no increase in odor. Improved adhesion, particularly to old paint, is a big feature. Outdoor aging characteristics are good.

	lb	gal
Paint base (62.3% NVM):		
Coumarone-indene resin		
Neville R-7	32	3.4
Dibutyl phthalate	27.5	3.1
Tergitol NPX	3.5	0.4
Aerosol OT, 85%	4	0.4

Mix 30 min @ 95°C, then cool to 55°C. Add slowly:

Gelva Emulsion TS22	346	37.6

Age 12 hr. Mix in an aluminum or stainless mixer:

Pigment slurry (47.4% NVM):		
Water	185	22.2
Tamol 731, 1%	5	0.6
Methocel 400 cps, 3%	100	11.9

With mixer running, sift in:

Titanox RA50	135	3.8
Albalith 14	120	3.4

Grind, add paint base and mix. Disperse in hot water:

Thickener solution (3% NVM)		
Methocel 400 cps, 3%	100	11.9

Incorporate into the mixer and mix for about 5 min. This yields the completed paint. Pass paint through an 80-mesh screen.

Coumarone-Indene Resin, Neville R-7, has low odor and light color, which charactertistics make it popular also in manufacture of chewing gum base. It imparts freeze-thaw stability without increasing odor, and improves paint adhesion. Resin melts at 108-112°C (cube in Hg) and softens at 93-96°C (ball-and-shouldered ring).

Gelva Emulsion TS22 is free-filming. Particle size is 0.5-1.0μ. Films are noted for water resistance and clarity. Coatings are irreversible.

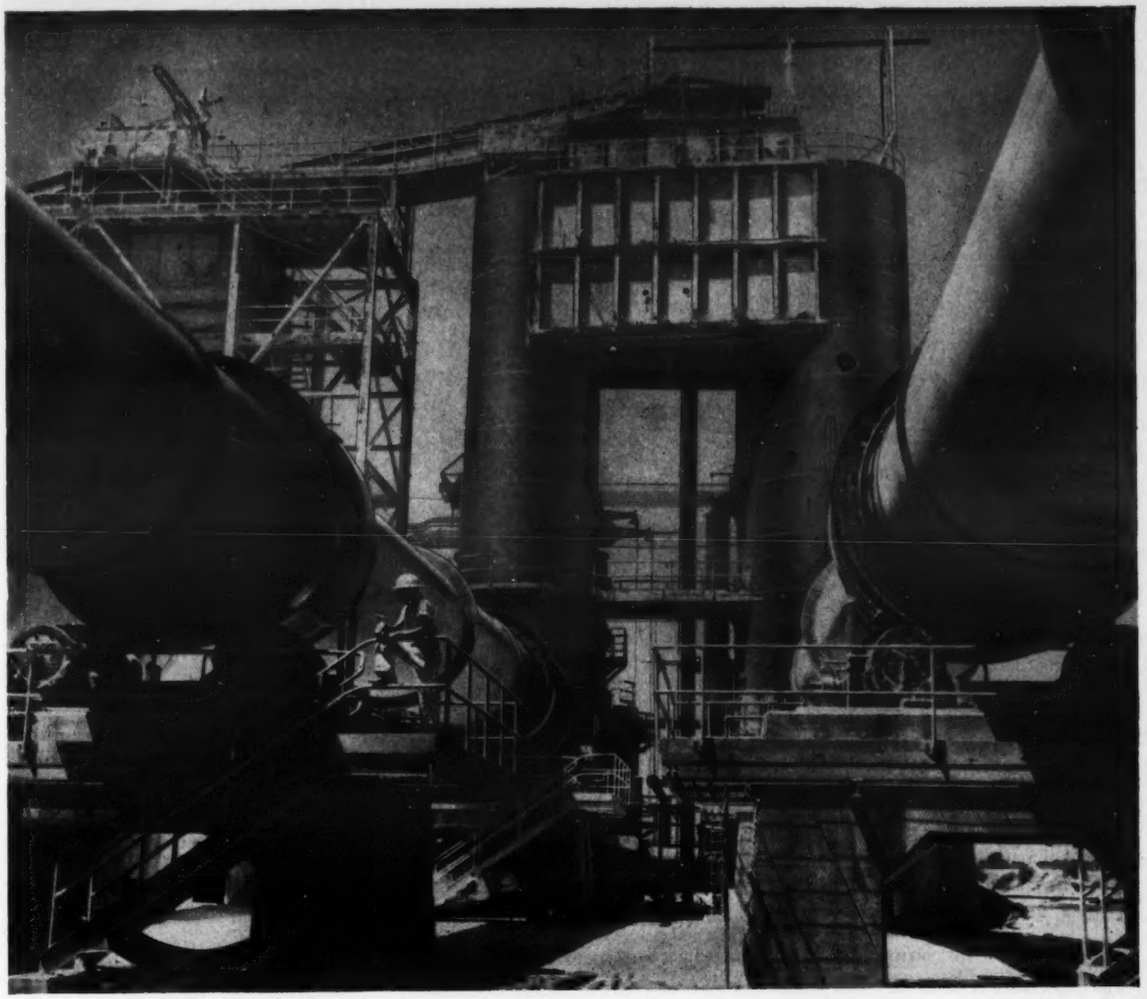
(Coumarone-Indene Resin R-7 is a product of Neville Chemical Co., Dept. CP, Neville Island, Pittsburgh 25, Pa. . . . or check CP 6764 opposite last page.)

(Gelva Emulsion TS22 for coating is a product of Shawinigan Products Corp., Dept. CP, 350 Fifth Ave., New York 1, N.Y. Check CP 6764A opp. last pg.)

Characteristics and applications of lithium metal, compounds

Detailed descriptions of the characteristics and applications of lithium metal, salts, and compounds are given in four-page technical data sheet.

Cat of lithium and lithium chemicals is issued by Lithium Corporation of America, Dept. CP, Rand Tower, Minneapolis 2, Minn. When inquiring specify CP 6765 on handy form opp. last page.



Mathieson Soda Ash: *there's always an 'r' in purity*

Purity knows no season in the production of Mathieson soda ash; oyster *shells* are available every month of the year. Here at Lake Charles, La., shells are the starting point of the ammonia-soda process. Taken from the Gulf by the thousands of tons, they are washed and placed in huge storage piles, then transferred as needed to the towering silos shown above. From the silos they are fed into large rotary kilns where carbon dioxide and lime of extremely high purity are obtained.

At *all* Mathieson plants, attention to raw materials helps assure the quality of products. In addition, buyers have the protection of multi-plant production facilities . . . 2 soda ash plants, 6 caustic soda plants, 5 chlorine plants, 7 sulphuric acid plants, 3 ammonia plants . . . plus practical technical assistance with materials handling and application problems. When planning current or future chemical requirements, be sure to call on Olin Mathieson. Perhaps you can buy to better advantage from one of America's largest, most diversified producers of basic industrial chemicals.

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OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

2851A

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ETHYLENE OXIDE • ETHYLENE GLYCOL • DIETHYLENE GLYCOL • TRIETHYLENE GLYCOL • POLYGLYCOLS • DICHLORDETHYLETHER • ETHYLENE DICHLORIDE • METHANOL • SODIUM METHYLATE • ETHYLENE DIAMINE

When inquiring check CP 6766 opposite last page

MAXIMUM PERFORMANCE AT MINIMUM COST

No other manufacturer produces a complete line of organic Chelating Agents for the control of metallic ions throughout the entire pH range. This means that the selection of the *right* Versene product can give your process or formulation *maximum chelating power at minimum cost* — regardless of the pH involved.

VERSENE — FOR METAL ION CONTROL

The importance of metal ion (trace metal) control is now fully recognized in Industry, Agriculture and Medicine. Metallic ion excesses or deficiencies represent the difference between success or failure in practically all chemical reactions — from soap detergency to metabolism in living things. Versene and Versene products provide the metal ion control desired with mole-for-mole accuracy.

UNDUPLICATED QUALITY

As pioneers in the Chemistry of Chelation and the manufacture of Chelating Agents, the five basic Versene products and the eleven additional Versene Compounds, represent unduplicated quality and guaranteed *uniformity* of chelating power. They still set the standards of chelation. A quarter-century of chelate research and experience is at your command. Ask for Technical Bulletin No. 2. Chemical Counsel on request.

"Chemistry's most precise chemicals"

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Kraft Chemical Co., Inc., 917 West 18th St., Chicago 8, Ill.
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Braun-Knecht-Heimann Co., San Francisco, Calif.
Van Waters & Rogers, Inc., Seattle, Wash. & Portland, Ore.
Braun Corporation, Los Angeles, California
Barada & Page, Inc., Houston, Dallas, Corpus Christi, New Orleans, St. Louis, Wichita, Oklahoma City, Tulsa, Kansas City, Mo.
Braun-Knecht-Heimann Co., Salt Lake City, Utah
George Mann & Co., Inc., 251 Fox Point Blvd., Providence, R. I.
European Manufacturing Agent:
Rexolinfabriken Aktiebolag, Helsingborg, Sweden

When inquiring check CP 6767 opposite last page

MATERIALS

Specifications given for fatty acids

Normal specifications for basic fatty acids used in industry are presented in 24-page catalog. Covered are distilled stearic, oleic, coconut, cotton seed, soya, and palm fatty acids, as well as information on glycerine, pitch, and hydrogenated tallow fatty acids.

"Fatty Acids in Modern Industry" is issued by A. Gross & Co., Dept. CP, 295 Madison Ave., New York 17, N.Y. Specify CP 6768 opposite last page.

Oil dispersion of NaH is highly reactive, easy to handle . . .

no prior preparation needed

Micron-range sodium hydride in oil dispersion is highly reactive, cuts reaction time and markedly increases production yields. Oil coating on hydride crystals protects reactive surface when handled in air, thus eliminating dust hazards and minimizing fire hazards. No preparation is required before use. Liquid can be poured, pumped, and metered.

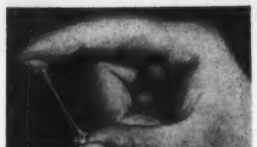
(Sodium hydride oil dispersion is a product of Metal Hydrides Inc., Dept. CP, 12-24 Congress St., Beverly, Mass. . . . or check CP 6769 opposite last page.)

Stearates — technical data

Recent technical information about the uses and benefits of metallic stearates is presented in 26-page booklet. Physical and chemical properties are shown for aluminum, barium, cadmium, calcium, lead, lithium, magnesium, and zinc stearates.

Form C-9 is issued by Synthetic Products Co., Dept. CP, 1636 Wayside Rd., Cleveland 12, Ohio. Specify CP 6770 on handy form opposite last page.

WHAT PIPE JOINT COMPOUND WOULD YOU SPECIFY TO HOLD . . .



Tacky enough to hold on to any type of surface

PERCHLORETHYLENE, TOLUENE, "FREONS"®, ACETIC ANHYDRIDE?

Leak Lock joint compound, with five years use in the chemical, refrigeration and aircraft industries, may be the answer to your "unsolvable" leaking joint problems.

Leak Lock has other unusual chemical properties . . . great adhesion and flexibility. It will resist almost everything except lower alcohols and caustic solutions. Ask us about your joint compound problems and request a sample.

Leak Lock

HIGHSIDE CHEMICALS COMPANY
16 COLFAX AVENUE, CLIFTON, N. J.

When inquiring check CP 6771 opposite last page

GRAPHIC VISUAL CONTROL

THE BOARDMASTER SYSTEM

★ Graphic Picture of Your Operations—Spotlighted by Color
★ Facts at a Glance—Saves Time and Eliminates Confusion
★ Simple and Flexible—Easily Adapted to Your Operations
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Complete Price $49.50 Including Cards

FREE 24-Page ILLUSTRATED BOOKLET AA-20 Without Obligation

GRAPHIC SYSTEMS, 55 W. 42nd St., New York 36

When inquiring check CP 6772 opposite last page

Processing of rubber materials having oil-resistant qualities possible with hydrocarbon . . .

shrinkage is minimized, and flow is improved during the cure

Uses: Compounding material should be of special interest to manufacturers of a variety of rubber products of the black, elastomeric type, for the processing of rubber materials that must resist petroleum oils and solvents and which demand adherence to minimal dimensional variations.

Features: Ingredient doesn't tackify raw compounds, thereby improving processibility, particularly with neoprene. Shrinkage is minimized, and flow is improved during cure. In extruded compounds, reinforcing and stiffening characteristics are imparted. This minimizes dimensional changes in raw compound without causing any appreciable decrease in Mooney viscosity.

Product promotes greater resistance to stiffening of vulcanizates at subnormal temperatures, therefore improving low temperature properties.

Description: Rubber compounding hydrocarbon is called BRC 22 Hydrocarbon. It has been developed to replace other hydrocarbons which are no longer available because of raw materials shortages.

(Rubber-processing hydrocarbon is a product of Barrett Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or for more information check CP 6773 on handy form opposite last page.)

"Don't just stand there! Get a ladder and some foam killer!"

VERSATILE POLYAMIDE RESINS CREATE . . .

New Metal-to-Metal "Plastic Surgery"

Was this crumpled fender "leaded out"? Replaced? Plastic soldered? You can't tell! For General Mills Polyamide Resins have again proved versatile—creating a new form of *safe, tough, economical* "plastic surgery" on metal.

Using atomized aluminum powder in Polyamide Resin 115 and epoxy resin, this solder feathers smoothly and adheres tightly.

SAFE! Unlike many epoxy curing agents there is no known case of Polyamide Resins having caused a single case of toxic or dermatitis reaction to personnel. They are non-volatile . . . never require dangerous bonding or curing temperatures . . . cure satisfactorily at room temperature for many applications.

TOUGH! Certain Polyamide-epoxy adhesives rate extremely high tensile shear strength, even after impact. They retain 3½ times more strength after 60 psi impact (4½ times more at 80 psi) than the best competitive adhesive tested recently —a well-known commercial formulation based on an *amine* cured epoxy.

ECONOMICAL! Polyamide Resins cost *less* than epoxy resins, blend with epoxies for superior adhesive properties at lower cost.

Perhaps your adhesive can be made from either thermoplastic Polyamide Resins or thermosetting blends of Polyamide and epoxy resins—structural or heat seal adhesives . . . solvent coatings . . . thermo-plastic cements . . . adhesives with high peel strength. From this selection, you can bond practically any substrate; metals and non-metals, porous and non-porous, including:

Aluminum	Leather	Polyester
Lead	Wood	Cured Phenolics
Glass	Plexiglas	Copper
Tenite	Polystyrene	Neoprene
Masonry	Mylar	Vinyls
Ceramics	Magnesium	Cellulose
Saran	Fabric	Nitro-cellulose
Steel	Paper	
Rubber	Acetate	

So don't delay. For more information, mail the coupon today.

We also manufacture complete lines of Fatty Nitrogen Compounds and Fatty Acids.

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General Mills CHEMICAL DIVISION
Kankakee, Illinois

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P-5-55

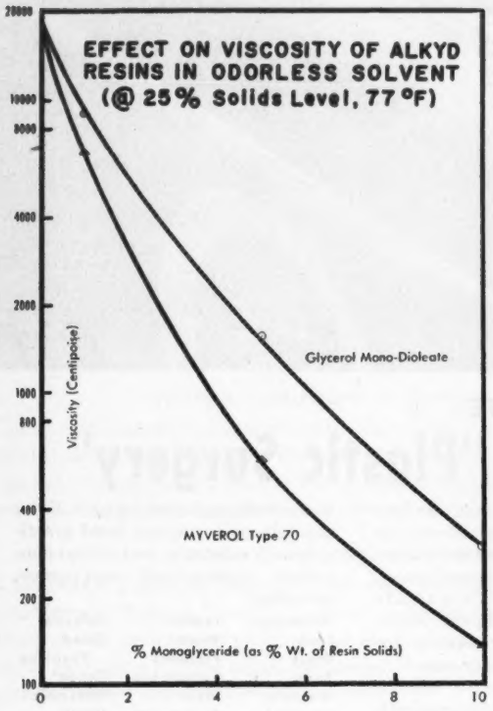
SEND THIS COUPON

When inquiring check CP 6774 opposite last page

Reduces viscosity and dilution limit of alkyd resins and odorless paints made from them . . .

glycerol monooleate improves hold out properties, brushability, and ease of grinding

Uses: Manufacturers of alkyd resins and those using these resins in making odorless paints now have a material which can increase solvency of the thinner system, cutting viscosity and stabilizing it against upward drift during storage.



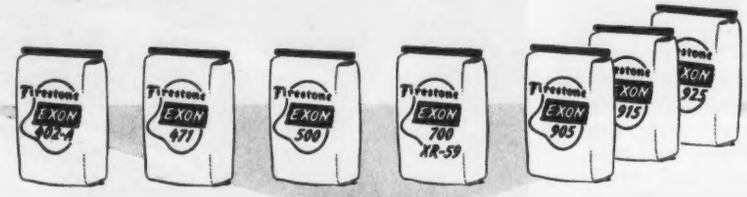
Features: Viscosity reduction and stabilization is accomplished with no loss in water resistance, adhesion, or durability. Additive improves hold out properties, brushability, and ease of grinding and pigment dispersion. Dilution limit is also lowered. Furthermore, less dispersant is required and thus less non-volatile, non-drying material is included in formulations.

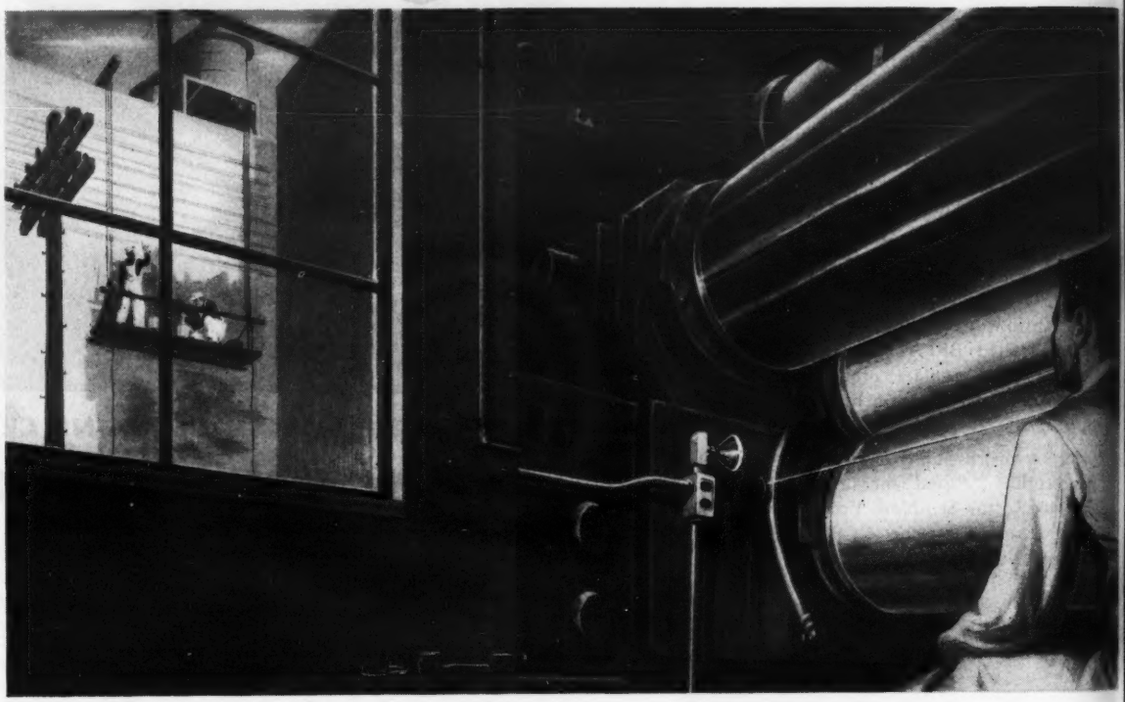
Description: Myverol® Distilled Monoglyceride, Type 70, is a concentrated and purified glycerol monooleate. It contains about twice the amount of active monoglyceride as conventional undistilled mono- and diglyceride mixtures. It is free of catalyst and soaps and is low in free fatty acid and glycerol.

Curve below compares viscosity effects of Myverol Type 70 and that of a typical mono-dioleate mixture in alkyd resin odorless paints. Formulation

EXON RESINS: each one engineered for

Specific Problems an





EXON 402-A

specifically to wipe out **CORROSION**

Base resin can be processed into a variety of useful forms, such as sheet pipe and rods. Unplasticized PVC resists industry's most corrosive conditions.

EXON 905-915-925

specifically for **PROCESSABILITY**

Temperature-tailored, they free your processing from restrictions due to temperature limitations. Blend speedily, fuse quickly into top quality products.

EXON 471

specifically for **WEATHERABILITY**

Unmatched for durability in a protective coating. Corrosion resistant.

EXON 500

specifically for **WIRE INSULATION**

Superior electrical properties; color, heat and light stability.

EXON 700 XR-59

specifically for **IMPREGNATION**

Exceptionally fast-fusing latex, compatible with conventional vinyl chloride plasticizers. Resultant films resist grease, oil, water, light.

Firestone

Chemical Progress Week May 16-21

s and Specific Uses

EXON 450
specifically for **STRIP COATING**
Good solubility, film tensile strength and durability allow formulations to be based on this one resin alone. Coatings can be spray-applied, and strip off cleanly and easily.

EXON 470
specifically for **SOLUTION COATINGS**
Has excellent adhesion to metals, alkyd and vinyl surfaces. It is compatible with various drying oils, alkyds, phenolics and melamines. Highly soluble in ketone solvents and has good aromatic tolerance.

EXON 468
specifically for **FLOORING**
Increases banbury output 10 to 25%. Fuses fast, processes easier, much more efficiently.

EXON 480
specifically for **RECORDS**
High bulking density and easy processing at low temperatures. Compatible with extender resins.

EXON 654
specifically for **PLASTISOLS**
Stir-in type, ideal for slush molding, foam vinyls, coating fabrics and thin film casting. *Needs no grinding.*

ALL RESINS in the ever-growing EXON line bring you short cuts to finer products.
Specific data on these resins are available to you on request. Call or write today.

CHEMICAL SALES DIVISION
FIRESTONE PLASTICS COMPANY, POTTSTOWN, PA., DEPT. 8N
DIVISION OF THE FIRESTONE TIRE & RUBBER COMPANY

When inquiring check CP 6775 opposite last page

contained 39% resin solids in mineral spirits and was reported to exhibit poor compatibility with odorless solvent. It was in odorless solvent at 25% solids level; temperature was 77°F.

(Distilled glycerol monooleate is a product of Distillation Products Industries, a Div. of Eastman Kodak Co., Rochester 3, N.Y. . . . or for more information check CP 6776 on handy form opposite last page.)

Controlled number of reactive groups built into silicone rubber gum simplifies compounding . . .

compression set of cured material is low over a wide hardness range

Uses: As a silicone rubber for gaskets, O-rings, and a variety of other molded parts.

Features: Controlled number of reactive groups built into the gum stock itself makes unnecessary many special techniques of compounding and curing. This should mean a reduction in cost of finished parts, and consequent expansion of applications. The number of variations that can be obtained using same general curing mechanism and simplified filler systems should prove of particular interest to those who do their own compounding.

Properties of the cured material that are of particular importance are low compression set over a wide range of hardness and use of conventional fillers. Good resistance to high-pressure steam, and thick-section cures without need for programmed post-cures are two more.

Description: Called W-96 Silicone Gum, a controlled number of reactive groups have been built into each silicone molecule. This permits a combination of typical post-cure properties of three compounds having different hardness such as shown below:

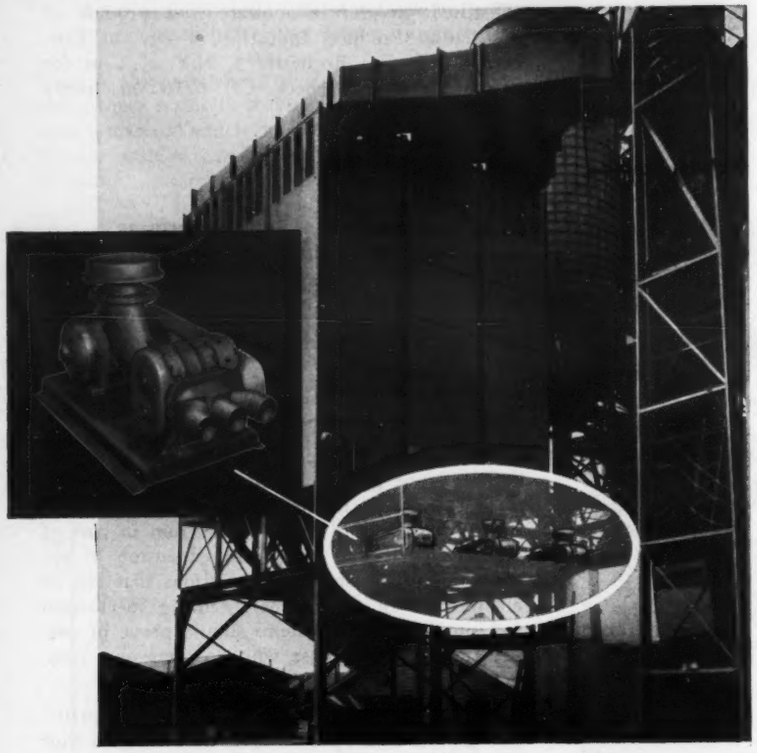
Hardness (Shore A)	40	60	80
Tensile (psi)	900	850	800
Elongation (% at break)	350	250	170
Compression set (% original deflection — Method B — 22 hr @ 350°F)	12	15	20

A variety of carbon blacks can be used as fillers. Such compounds are readily cured, and exhibit properties similar to those obtained with conventional silica fillers. Semi-conductive silicone rubber is now possible.

(Silicone gum stock is a product of Silicones Dept., Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or for more information reader may simply check CP 6777 on handy form opposite last page.)

MIEHLE-DEXTER BLOWERS

eliminate filter clogging, caking, shaking and disposal



HOW PRECIPITATOR COSTS ARE REDUCED FOR GRAVEL AND ASPHALT PLANT

The nation's growing battle against air pollution focuses attention on the need for modern precipitator equipment. Manufacturers like Western Precipitation Corp. have learned how Miehle-Dexter Positive Displacement Blowers help assure smoke and dust abatement.

For instance, on this Detroit, Michigan installation, located at a gravel and asphalt plant, three belt-driven M-D Blowers provide pressure air for cleaning the filters. Old-fashioned methods of shaking filters clean are eliminated. What's more, there is no clogging or caking of filters . . . no need for washing them. Costs of operating and maintaining this equipment are reduced.

Miehle-Dexter Blowers save weight and space, require little or no maintenance. *Capacities available:* 50-4000 c.f.m. or multiples thereof with single-drive arrangements. *Discharge pressure:* to 14 p.s.i.g. *Vacuum:* to 15" h.g.

For more complete information, check and mail this coupon for new catalog No. 255.

MIEHLE-DEXTER SUPERCHARGER, Division of Dexter Folder Company
105 Fourth Street, Racine, Wisconsin

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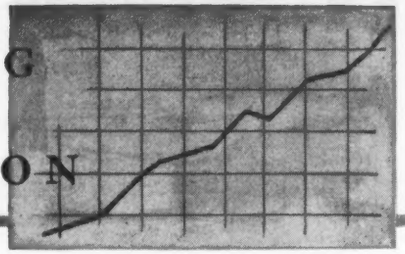
When inquiring check CP 6778 opposite last page

EXPANDING CHEMICAL PRODUCTION



New isocyanates plant started at Moundsville, W. Va.

National Aniline Division of Allied Chemical & Dye Corporation has announced plans for construction of a completely-integrated organic isocyanates plant at Moundsville, W. Va. Completion has been set for early next year.

Unit will produce varied line of isocyanates, including diisocyanates of toluene, ditolyl, and diphenylmethane.

Location adjoins National Aniline's recently-completed maleic anhydride, fumaric acid and catalytic aniline operations, and the Solvay Process Division's chlorine, caustic soda, and chlorinated methanes plant.

Organic isocyanates, plus the polyurethane products made from them, have emerged as a broad class of synthetic organic chemicals with potential as raw materials in the manufacture of plastics, resins, surface coatings, fibers, and synthetic rubbers.

Plant to supply dispersions of pigments, carbon blacks

New facilities to supply polyethylene producers with dispersions of pigments and carbon blacks have been opened at Orange, Texas.

Operation is under Acheson Dispersed Pigments Co., a subsidiary of Acheson Industries, Inc. The new outlet is expected to supply such large polyethylene producers as DuPont, Bakelite Division of UCC, Spencer Chemical, Monsanto, Dow Chemical, Koppers, and Texas Eastman, all located in that area.

Dispersed pigments are widely used in the coloring of plastics.

Plan to double output of maleic anhydride

Reichhold Chemicals, Inc., has announced that production of maleic anhydride at its Elizabeth, N. J., plant will be doubled by fall. Use of a new catalyst and modification of the conversion system is expected to provide the production boost to five million pounds per year.

By the Reichhold process, maleic anhydride is produced through oxidation of benzene in fixed bed converters in presence of the catalyst. After absorption by water, maleic is dehydrated, purified by distillation, and pelletized.

Scientific Design Company, Inc., New York, developed the new catalyst and cooperated in process design.

Monsanto plans vinyl chloride polymer, copolymer expansion

With added facilities for the production of vinyl chloride polymers and copolymers, Monsanto Chemical Company's Plastics Division expects to double resin output at its Springfield, Mass., plant. Construction of the new facilities has already begun.

DuPont picks site for TEL, "Freon" plant

Antioch, California has been selected by DuPont as the site for its proposed plant for the production of tetraethyl lead and "Freon" refrigerants.

Increased demands for tetraethyl lead and expansion of the air-conditioning, refrigeration, and aerosol industries on the West Coast led to Antioch as plant site.

News about chemical materials in the US – *plant construction, increased production . . . on stream now or planned for future*

Brea to operate nitrate plant

Brea Chemicals, Inc., of Brea, Calif., will operate a new ammonium nitrate plant now under construction adjacent to its ammonia plant. The unit, to have a capacity of 50,000 tons/year of fertilizer grade ammonium nitrate, is expected to be operating by midsummer.

Brea, a subsidiary of Union Oil Co. of California, will also operate a 210,000-gal ammonium phosphate production unit now under construction at Fresno, as an adjunct to its 2,310,000-gal aqua ammonia distribution terminal.

Borden acquires American Monomer, Monomer-Polymer firms

American Monomer Corp., one of the country's largest producers of polyvinyl alcohol, and Monomer-Polymer, Inc., engaged in research on thermoplastic materials and specialized monomers and polymers, have been acquired by the Borden Company's Chemical Division.

Purchase of these two firms follows Borden's policy of expanding its production of thermoplastics and activities in the thermosetting field.

Oxo alcohol plant on stream

Standard Oil Company's recently-completed Oxo alcohol plant at Wood River, Ill., began operations with first tank car shipments of isooctylalcohol to Indoil Chemical Co.

The Oxo Process used in the plant had its beginning in German developments during World War II. Standard spent five years perfecting the process before beginning construction in 1951.

Formaldehyde now available in higher concentrations

Nitrogen Division, Allied Chemical & Dye Corp., is producing formaldehyde in higher concentrations at its South Point, Ohio, plant.

New facilities, developed by Nitrogen Div's laboratories and constructed by the Girdler Co. of Louisville, Ky., produce formaldehyde in concentrations up to 50 per cent, compared to the 37-45% formerly produced.

Plan $16,000,000 program for making fertilizer

Standard Oil Co. of California has begun work on basic processing units as part of a $16,000,000 fertilizer program.

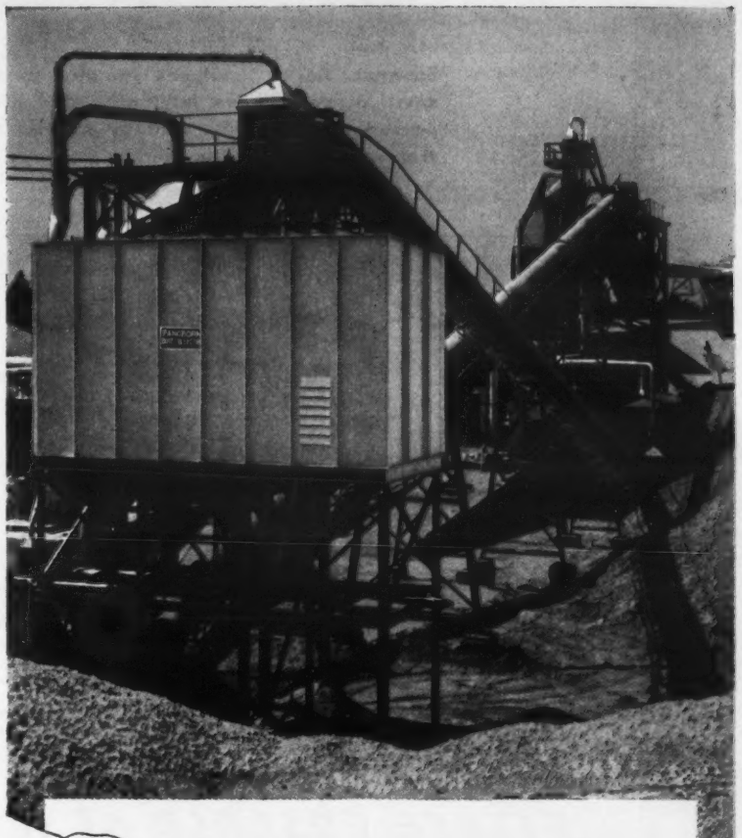
An ammonia and nitric acid plant will be erected at Richmond, Calif., and California Spray-Chemical Corp., a subsidiary of Standard, will construct a fertilizer plant to use a substantial portion of the nitric acid output.

Capacity of the combined units is expected to reach 300 tons of ammonia per day.

Expansion program increases potash production

Expansion of International Minerals & Chemical Corp's Niagara Falls plant has increased capacity of the basic chlorine caustic potash by 25%, to 25 tons/day chlorine, and doubled capacity for liquid caustic potash and potassium carbonate. A new unit for the production of 60 tons/day 20-degree Baume hydrochloric acid has also been installed.

Plans are also underway to expand company's facilities at Carlsbad, N. M., to boost output of potassium sulfate to 150,000 tons.



Fletcher brings dust "down to earth!"

Pangborn Dust Control collects valuable material to be sold as soil conditioner

The H. E. Fletcher Co., West Chelmsford, Mass., produces a wide variety of granite products. When Fletcher recently expanded plant operations, the firm installed Pangborn Dust Collectors on the recommendation of an already-satisfied user of Pangborn Dust Control. The results at Fletcher have been extremely gratifying. Costs have been cut in three ways: valuable collected material is sold as soil conditioner, the life of expensive machinery is lengthened by reducing dust damage, and plant housekeeping is cheaper and easier. Other benefits, according to the company, include the reduction of health hazards to employees and the improvement of product quality.

Pangborn can solve *your* dust problem. Pangborn engineers will be glad to show you how Pangborn Dry or Wet Dust Collectors can save you time, trouble and money!

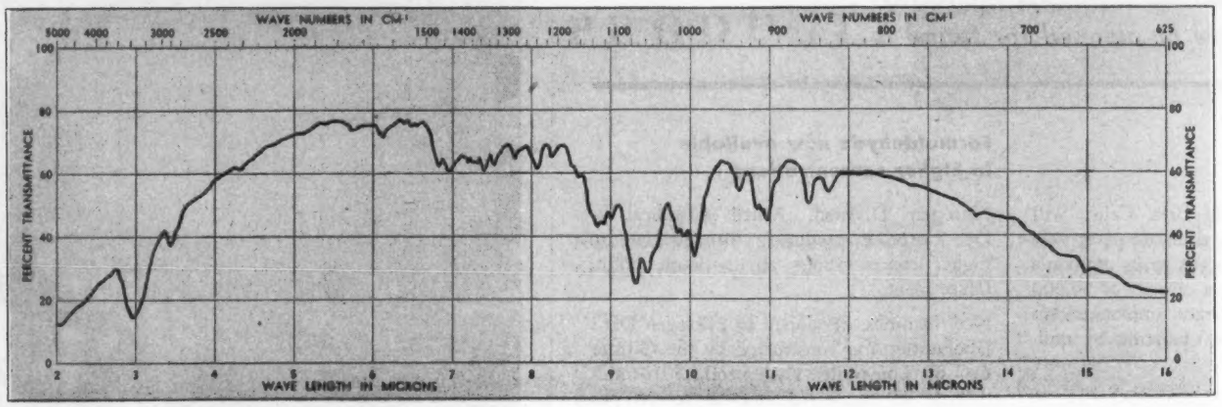
See how Pangborn benefits varied industries. Write for free copy of "Out of the Realm of Dust." Pangborn Corp., 2700 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment.*

Pangborn
CONTROLS DUST

When inquiring check CP 6779 opposite last page

Eastman Kodak analyzes samples of solids as small as twenty-five millionths of a gram by a procedure which has already proved to be of tremendous interest in medical research.

This infrared record was obtained using part of a single grain of table sugar. Entire grain weighed 0.0005 of a gram and the infrared pattern shown is from 0.000025 (25 millionths) of a gram or from only 1/20 of a grain of sugar. This record is proof, to an infrared spectroscopist, that the substance ▼ under test is sucrose



Hydraulic press, infrared spectrophotometer and beam condensing unit combine to solve wide variety of problems and —

assure absence of impurities from color film

DR. DON H. ANDERSON,
Chemist, Industrial Laboratory
Eastman Kodak Company, Rochester, N. Y.
with **GORDON WEYERMULLER,** Associate Editor

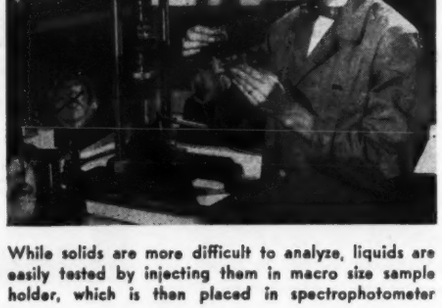
Problem: Previous methods of analysis used at Eastman Kodak Company to detect small quantities of impurities in order to maintain the quality of color film were not entirely satisfactory. The identification of minute quantities of solids presented a stumbling block that could not be easily overcome by conventional methods of infrared analysis.

Solids are in general more difficult to analyze than liquids or gases, as frequently they cannot be dissolved, ground up, or sliced uniformly enough to be examined directly. Solids have usually been analyzed by dispersing the finely ground sample in USP mineral oil. This method has the disadvantage of introducing several interfering mineral oil bands that might otherwise be useful.

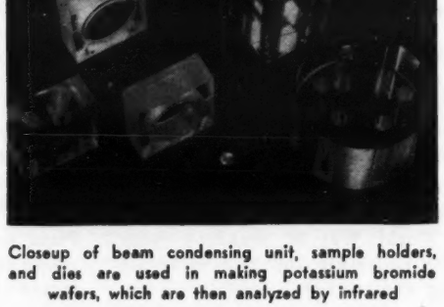
Solution: Approximately 1½ years ago Eastman scientists, combining experience in the fields of optics and chemistry, developed a device called a "beam condensing unit." This unit is used in conjunction with a method of mounting samples in potassium bromide. The procedure for obtaining infrared curves can be easily applied to samples weighing as little as twenty-five micrograms and to some types of samples weighing only five micrograms, (five millionths of a gram.) The method has already proved to be of considerable interest in medical research where tiny samples of hormones and other steroids must be identified.

The beam condensing unit is constructed using two silver chloride lenses which transmit infrared energy. (Glass lenses are opaque in this region.) The beam condensing unit is designed to squeeze the 1 by 1½ inch beam of a conventional infrared instrument into a space of only 0.03 by 0.16 inches.

The spectrophotometer used is a double-beam type which automatically refers data to a true zero and yields spectrograms on a transmission versus wave length chart. This assures reproducibility of results, speed of analysis, and simplicity of operation. The



While solids are more difficult to analyze, liquids are easily tested by injecting them in macro size sample holder, which is then placed in spectrophotometer



Closeup of beam condensing unit, sample holders, and dies are used in making potassium bromide wafers, which are then analyzed by infrared

Laboratory press is used to form ¼" diameter potassium bromide wafer. Note particularly low pressure required with micro samples

After pressing, the sample, held on plastic block, is set between lenses of beam condensing unit. Assembly can then be inserted in spectrophotometer in a few seconds

absorption band pattern formed on the chart enables the impurity to be quickly identified by comparison with charts of known samples.

In order to place the tiny samples in the narrowed down beam of the instrument, they are mixed with 200 parts of potassium bromide according to a method described just a few years ago by Sister Stimson of Siena Heights College* and pressed into small translucent wafers. Potassium bromide is ideal for a support medium, since it is transparent in the infrared, and can be formed with reasonable pressures. In the case of micro samples these need not be pressed in a vacuum because the tiny strips and discs are so small that almost no air is entrapped. Larger pressings are usually made in a vacuum die with which discs as clear as window

*Siena Heights College, Adrian, Mich.

(*Continued on page 66*)

Turbo-Topics

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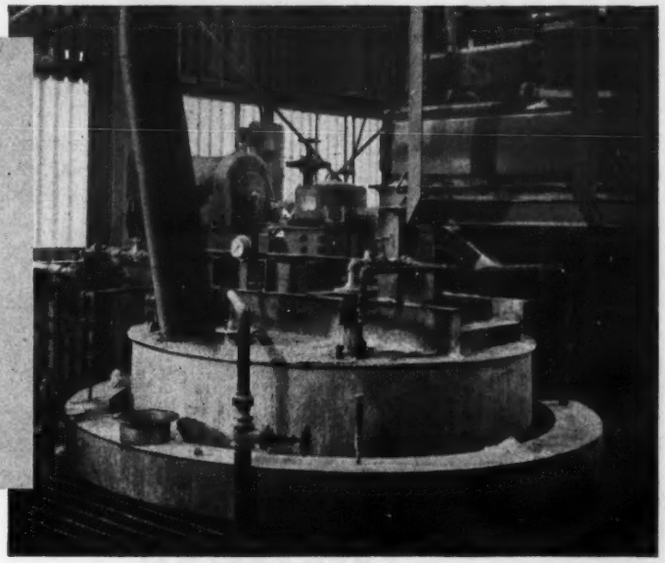

Acid Neutralizer At Phosphate Products Plant of Virginia-Carolina Chemical Corporation, Fernald, Ohio. Phosphoric acid is neutralized in the pictured Turbo-Mixer at the Fernald plant. It provides suspension and distribution of solids for uniform reaction on a Continuous-Flow basis and promotes removal of evolved gases.

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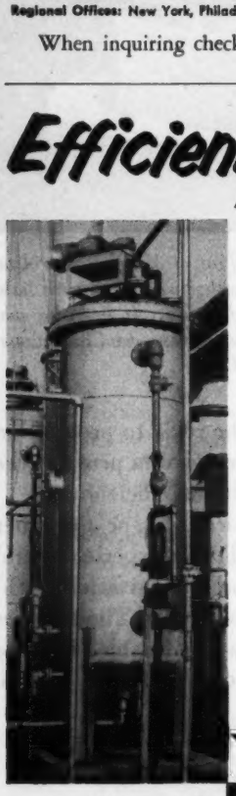

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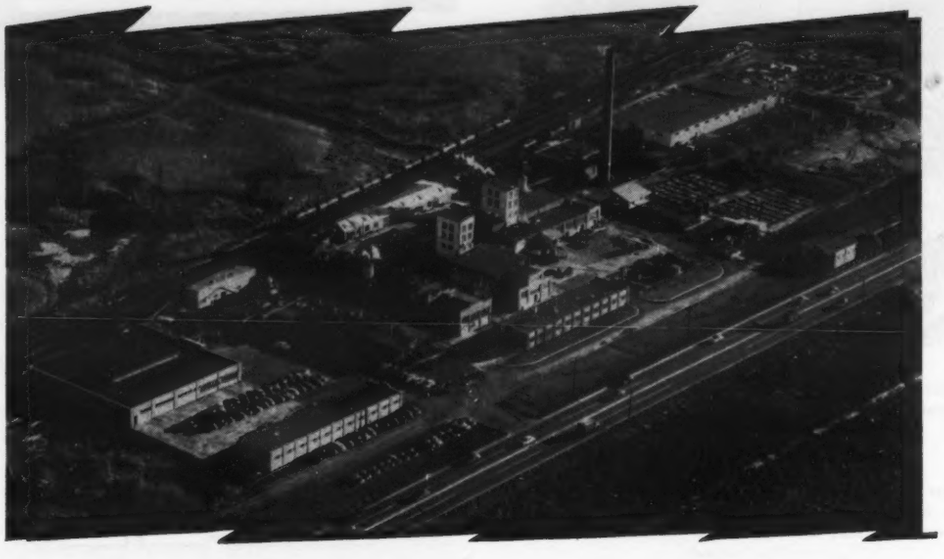


. . . two-way radios on vehicles speed material handling by —

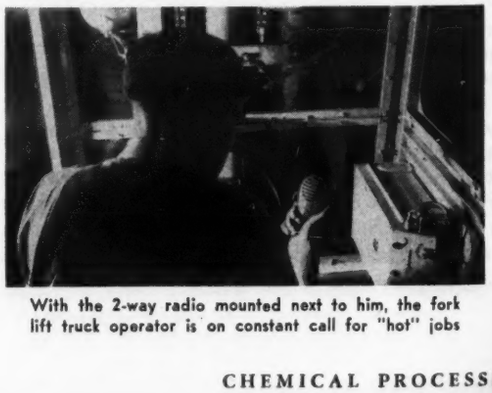
keeping tab on trucks

Since the FCC set up frequency allocations for the industrial use of 2-way radios about six years ago, more than 750 plants have installed 2-way radio systems. Both large and small plants have found that the units pay off. Typical example is Trubek Laboratories, East Rutherford, New Jersey. Employing only about 180 people, the plant covers approximately 18 acres, and produces some 400 different fine organic chemicals.

Officials report that adding the 2-way radios to their material handling trucks has been more beneficial to the overall operations than if they had doubled the number of vehicles. Besides the base station radio in the dispatcher's office, 4 mobile units are mounted in the cabs of the company's stake truck and fork lift trucks. Used for all sorts of jobs throughout the plant, the radio-equipped trucks can always be "on-the-spot" when needed.

In every plant, timing is important to overall efficiency. Incoming trucks and freight cars should be met and unloaded as speedily as possible. Movement of raw and semi-finished products within plant is often required at a moment's notice. Because it is not always possible to know in advance when and where material handling trucks should be, valuable time is sometimes wasted in locating a vehicle suitable for the job.

Even a routine job can develop a problem and take the truck driver out of the area in which he is working. To the dispatcher he is then "lost" until located by phone or a quick excursion around the plant.



With the 2-way radio mounted next to him, the fork lift truck operator is on constant call for "hot" jobs

Truck driver can talk to dispatcher from anywhere in plant area without leaving truck

Until the summer of 1952, Trubek's yard foreman, who is also the dispatcher for the three material handling trucks, used a bicycle to track down the trucks when they were "lost" and needed in a hurry. Truck drivers would only report to him (via telephone) when they were finished with the job they were doing. The system, although operated only in a small area, still did not provide the coordination for a smoothly running materials handling operation. That's why the radio system was installed.

Licensed to operate on 154.57 mc, the 2-way radios at Trubek supply the control and flexibility needed for the operation. Wasted motion has been practically eliminated, because every vehicle can be contacted instantly and dispatched to point in greatest need. Each truck driver is as near the dispatcher as his 2-way radio microphone.

When completing a job, truck driver does not have to hunt a phone or return to the dispatching office for instructions. He just radios for a new assignment and is on his way while still receiving directions. It is estimated that each truck is now doing at least two or three times more work than under the old system.

(Two-way radios are product of Motorola Communications and Electronics, Inc., A subsidiary of Motorola, Inc., 4501 Augusta Blvd., Chicago 51, Illinois . . . or check CP 6783 opposite last page.)

Ideas for corrosion control—
See July CP . . .

Recent, pertinent technical papers on corrosion control will be condensed in the July issue. This feature section will give you ideas for battling corrosion in your own plant.

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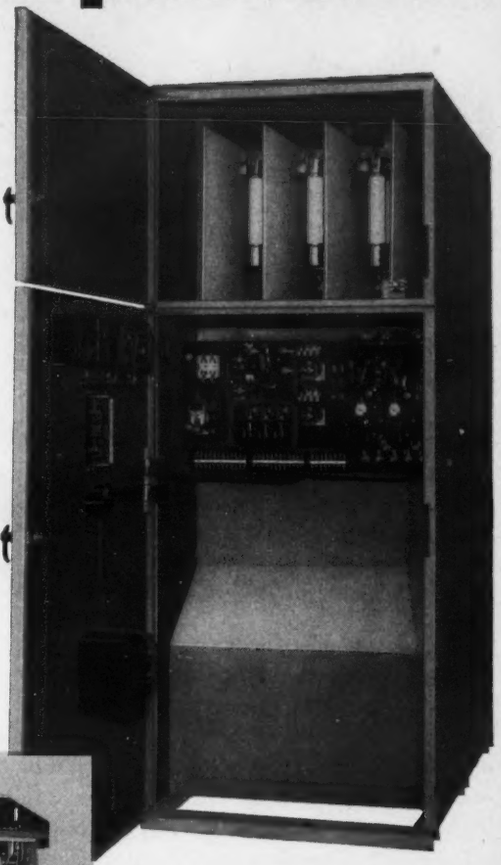

THE Allis-Chalmers Type H high voltage starter is a complete control unit. Everything needed for efficient motor control and positive protection is engineered into one easy-to-install cubicle.

Control functions, varying with specific job applications, include full or reduced-voltage starting, acceleration, speed control, reversing or non-reversing, and dynamic braking.

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Time-Delay Undervoltage Relay permits restarting if power is restored within its setting.

Compartmented Enclosures isolate high voltages. Dead front construction and electrical interlock on fuse compartment provide additional personnel protection.

For complete information, see your Allis-Chalmers representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 14B6410B.

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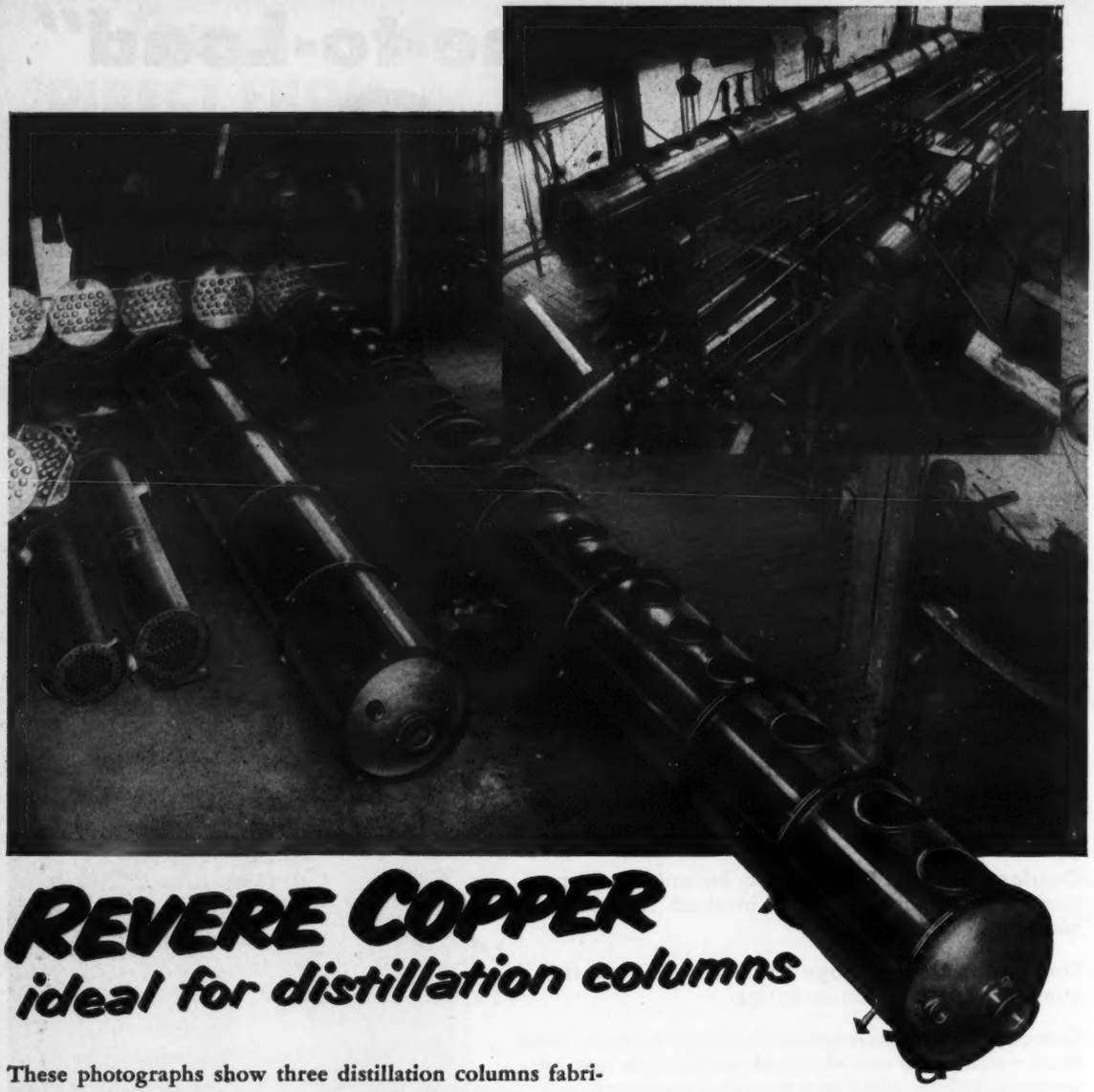
When inquiring check CP 6784 opposite last page



REVERE COPPER
ideal for distillation columns

These photographs show three distillation columns fabricated by American Copper & Brass Works, Cincinnati 2, Ohio, for a customer in a foreign country. They are made of Revere Copper Sheets and Circles. All told, 4608 pounds of copper were required. The columns will be used to distill high-proof alcohol, either beverage or industrial.

Longitudinal seams were welded. Flanges were produced by simply turning the metal over to the required dimension. Copper, you see, is extremely easy to work. In addition, it does not react with alcohol and a wide variety of other liquids and gases. Copper also can be quickly and economically welded by modern methods, and if you wish, the Revere Technical Advisory Service will be glad to show you how to do a fast and sound welding job on copper sheet and plate. See the nearest Revere Sales Office.

Two views of three copper distillation columns by American Copper & Brass Works, Cincinnati. The large holes will be closed by removable plates, for inspection and cleaning.

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When inquiring check CP 6785 opposite last page

IDEAS

COLOR FILM

(*Continued from page 63*)

glass can be made.

Results: Method has enabled company to quickly detect and identify minute quantities of impurities. It is used mainly for qualitative analysis in testing of chemicals and in the identification of spots on film and lenses. However, some quantitative work is also done. It is used day in and day out in seven of Eastman Kodak's infrared laboratories which cover basic research, quality control, and development work. Equipment has been found to be simple and easy to operate. Units have required only a minimum of maintenance.

(Laboratory press is a product of Fred S. Carver Inc., 52 River Rd., Summit, N. J. . . . or for more information check CP 6786 on handy form opposite last page.)

(Infrared recording spectrophotometer and the complete beam condensing unit with dies to make macro and micro potassium bromide wafers are available from Baird Associates, Inc., Dept. CP, 33 University Rd., Cambridge 38, Mass. . . . or for more information check CP 6786A on handy form opposite last page.)

"Push-button" production line ups foam rubber plant output over 50 per cent . . .

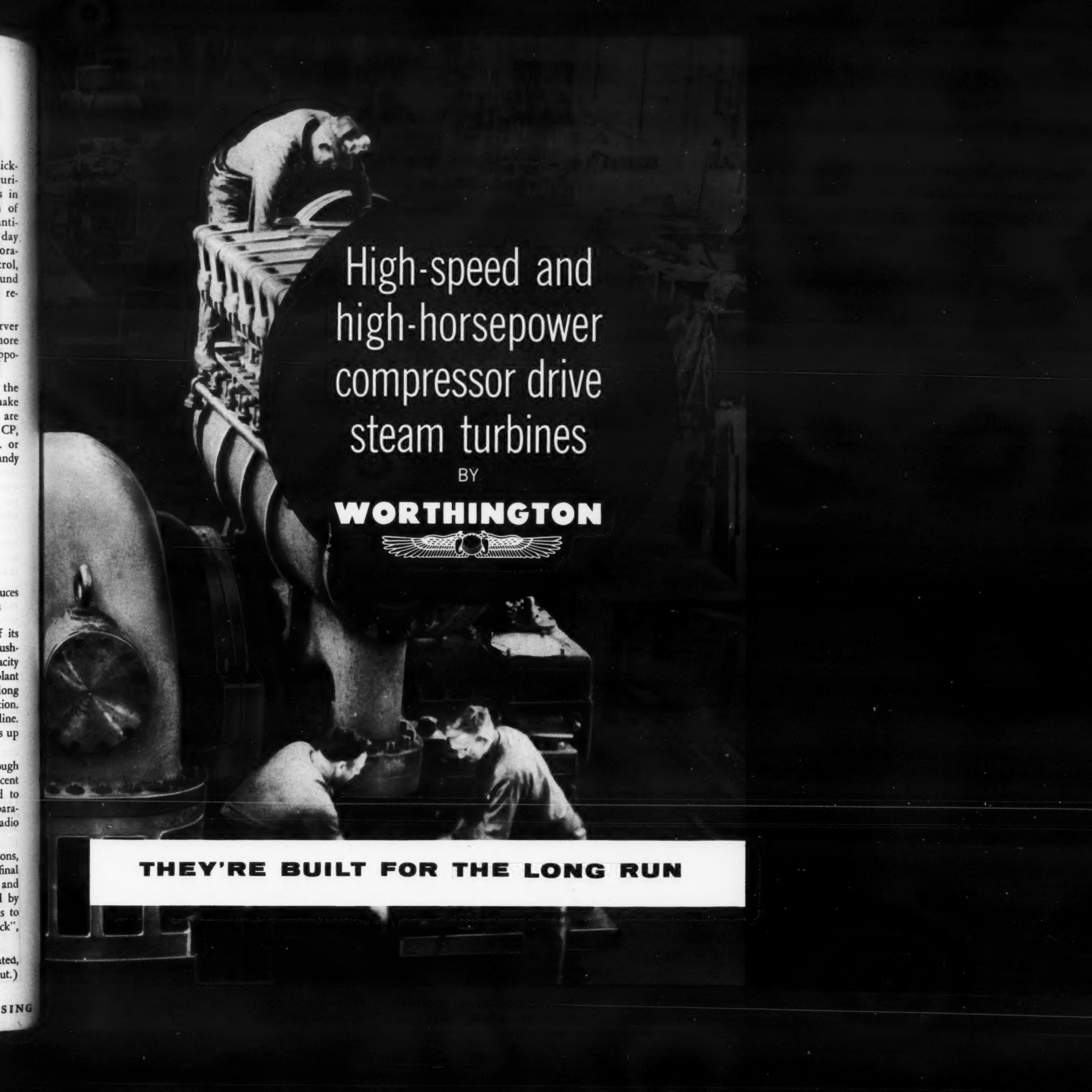
costs $1.5 million, is 400 ft long; produces sheets 72 inches wide in variety of colors

Reported to be the largest and most modern of its kind in the rubber industry, $1.5 million "push-button" production line has increased the capacity of Hewitt-Robbins' Fremont, Ohio, foam rubber plant by more than 50 per cent. Equipment is 400 ft long and incorporates latest developments in automation. Continuous sheets, 72 inches wide, roll off the line. These are made in variety of colors, in thicknesses up to two inches.

Latex is fed into feed end of equipment through a pipeline running from storage tanks in an adjacent building. Seconds later the material is exposed to high-frequency waves generated by electronic apparatus which consumes more electricity than six radio stations.

After thorough "baking" by electrical oscillations, product moves into a steam-heated oven for final curing. Upon completion of this it is washed and dried. Reports are that the latex is not touched by hands from the time it leaves rubber plantations to time it emerges in continuous strip of "slab stock", ready to be cut and packaged.

(Information courtesy Hewitt-Robins Incorporated, Dept. CP, Glenbrook P. O., Stamford, Connecticut.)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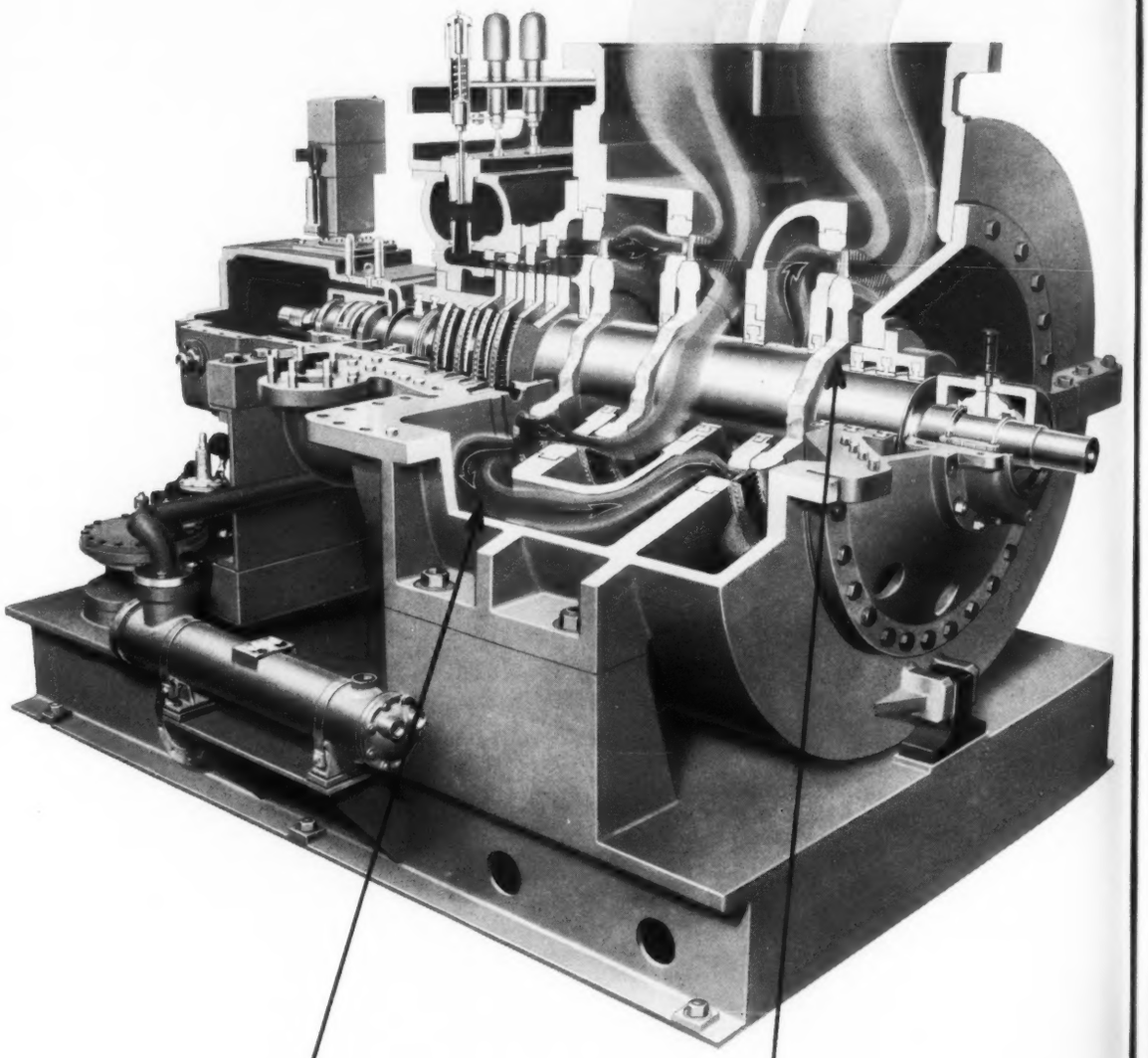

DOUBLE-FLOW EXHAUST CONSTRUCTION. When you need it, this construction is supplied. By directing half the steam through one set of blades, and the other half through another set of blades, wheel size and blade length are significantly reduced. This lessens danger of extreme stresses and eliminates necessity for complicated blade design.

SOLID ROTOR (wheels forged integral with shaft) used on all Worthington High-Speed Turbines is naturally stronger, eliminates the need for a wide wheel hub, permitting a more conservative and lighter design. Extra benefit: it also decreases turbine's length — simplifying critical speed problems.

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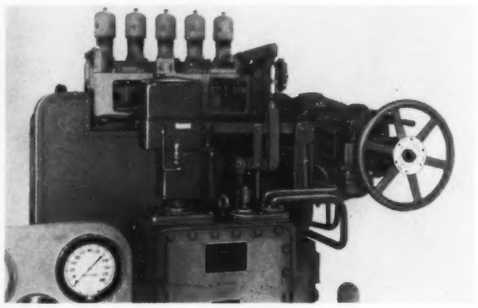
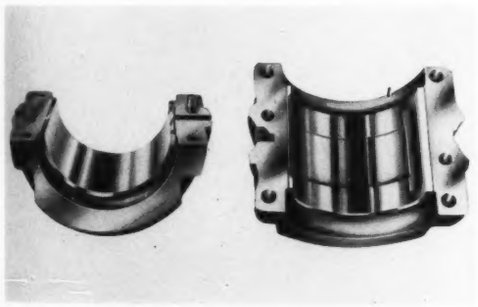
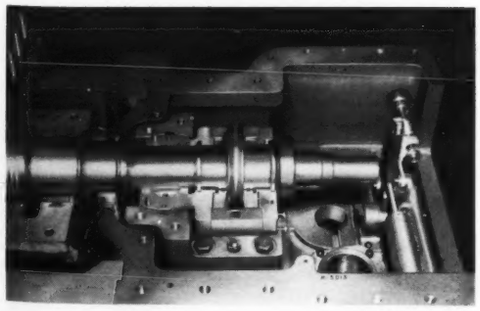


3 EXAMPLES

WOODWARD GOVERNOR WITH BUILT-IN AIR HEAD. Air motor operates directly on governor speed changer spring. Result: turbine is *always* under control of speed governor for *any* setting of air motor. Tendency for speed changes due to variations in steam conditions is automatically compensated for *before* affecting the compressor.



HIGH-SPEED ANTI-OIL-WHIP BEARINGS are machined with dead-end groove in top half in which pressure builds up to force journal downward at all times. This overcomes shaft's natural tendency to climb in the bearing — which would result in whipping at high speeds. High lube pressure assures smooth operation at all times.



SINGLE COLLAR KINGSBURY-TYPE THRUST BEARING on Worthington Steam Turbines permits high speeds with small friction losses. The single collar also enables journal bearing to be placed closer to turbine casing — reducing bearing span while keeping all parts of thrust bearing away from hot steam parts.

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For more information on product at left, specify CP 6787 . . . see information request blank opposite last page.

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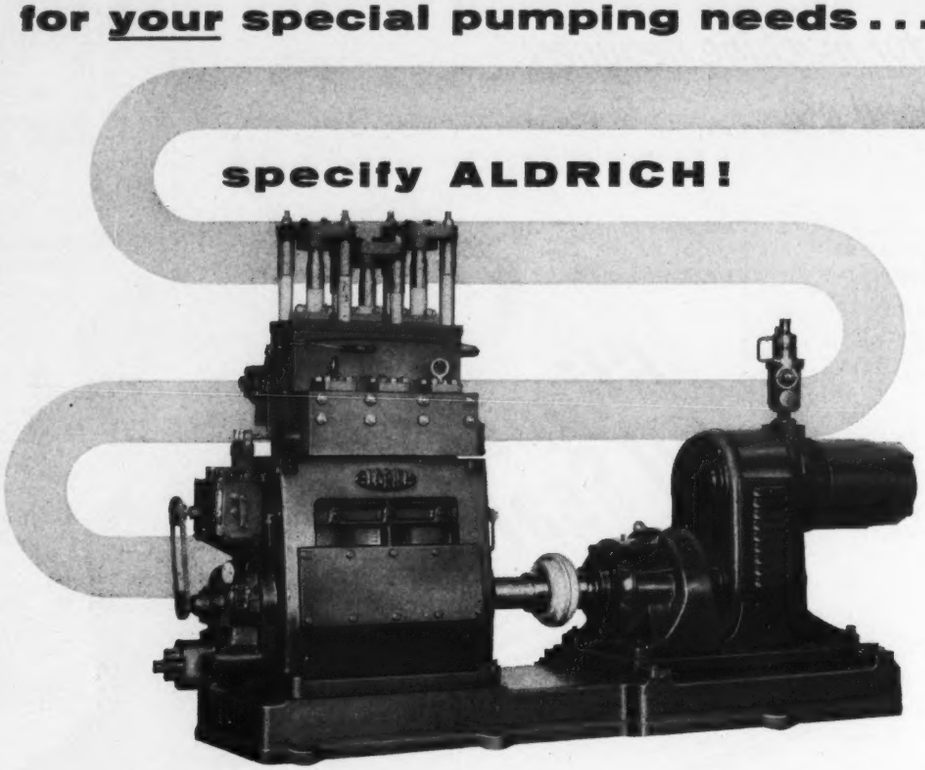

Here's an Aldrich Triplex specifically made to pump very highly abrasive slurry that would make short work of most pumps. A typical special Aldrich design, it features solid porcelain plungers—Kennametal ball valves and seats—an oversized oil pump for slow operation. Variable drive is provided by a U. S. Varidrive motor operated by Varitrol automatic control.

Aldrich Pumps are ideal for applications involving corrosion, high viscosity, high pressure, or abrasive materials . . . and the complete range of sizes insures a proper Aldrich pump for every need. Ask for recommendations to meet *your* chemical pumping needs.

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When inquiring check CP 6789 opposite last page

Gamma-radiation facilities installed for Battelle Institute . . .

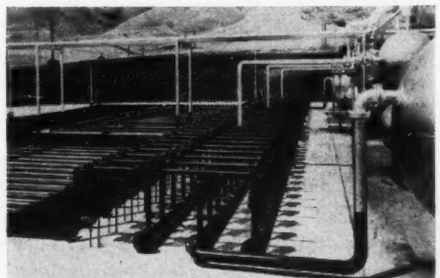
will house 10,000-curie cobalt-60 source for nuclear energy research

As part of a rapidly expanding program of nuclear energy research for industry, Battelle Institute, Columbus, Ohio, is installing one of the country's largest gamma-radiation sources. Designed to house 10,000 curies of cobalt-60 in 14-ft-deep water tank, the facilities will be used for activating or "triggering" chemical reactions, and to study new methods for sterilizing foods and drugs.

Initial source will consist of 2000 curies of cobalt-60 —equivalent in radioactivity to $24 million worth of radium. The radioactive substance will be contained in a number of vertical circular-arranged stainless steel tubes. Materials to be irradiated are placed in containers within the circle.

Eighteen-foot manipulators will enable remote handling of the source and materials being exposed. Water above source will provide natural radiation shield for personnel. Illumination will be supplied by underwater spotlights. Engineering and construction is being done by American Machine and Foundry Company, New York, N.Y.

(Information courtesy of Battelle Memorial Institute, Dept. CP, 505 King Avenue, Columbus 1, Ohio.)



World's largest trap farm (Brea Canyon oil field, California) is reported to have largest installation of automatic plug valve actuators: forty of them. Devices are used to turn valves remotely or automatically.

Each actuator has a solenoid valve energized by a time clock, thus permitting actuator's cylinder to position plug valve on the line. Automatic recording devices stamp percentage of water content of the individual oil well on a recording tape. Tape becomes permanent record of well's condition, eliminating manual checking.

(Plug valve actuators are product of Pantex Corporation, Dept. CP, 521 Roosevelt Avenue, Pawtucket, R. I. . . . or for more information check CP 6790 on the convenient Reader Service slip which is located opposite last page.)

Overgrown pilot plant produces tailor-made polymer plastics

Development plant at Kobuta, Pennsylvania, is a combination laboratory and over-grown pilot plant in which semi-commercial quantities of new plastic products may be produced for market testing, and simultaneously tailored to specific needs of customers. Plant will concentrate on development of polymer and copolymer plastics which may be injection molded, extruded, or expanded into shape.

Large and small reactors are housed in main building. Facilities are available for centrifuging, drying, extruding, and warehousing products processed in plant. Extra floor space has been provided for installation of additional equipment as needed.

(Development plant is part of Chemical Division, Koppers Company, Inc., Dept. CP, Koppers Building, Pittsburgh 19, Pennsylvania.)

Air pollution control in Great Britain

History of air pollution control in Great Britain is reviewed in 10-page paper. It tells how sporadic and disjointed efforts have been to get positive action on the vital problem. Paper contrasts different state of feelings at time when last two committees were appointed. Details of committee's 1953-1954 operations and recommendations are presented.

To obtain paper 55-APC-1 remit 50c direct to Order Dept., American Society of Mechanical Engineers, Dept. CP, 29 West 39th Street, New York 18, New York.

For more information on product at right, specify CP 6791 . . . see information request blank opposite last page.

ONE MORE REASON TO CHOOSE PRITCHARD COOLING TOWERS:

EVERY MEMBER IS WORKING HARDER NOW— YOU SAVE ALL THE WAY DOWN THE LINE!

That's why the new Pritchard cooling tower framework design means savings to you. The new design utilizes materials to the fullest possible extent. As an example, each diagonal member is used in both tension and compression. Result . . . a stronger, more efficient structure.

What does this mean to you? It means that Pritchard towers now offer you the following new advantages:

- Elimination of excess framework members reduces material and freight costs.
- Installation is faster and easier. You save on field labor costs.
- Basin cost is far less. Simplified design requires anchoring only around the periphery of the tower. Inside the basin, it is no longer necessary to build post-supporting piers — post extensions can be provided at far less cost.
- A Pritchard tower is now even easier to maintain . . . there are fewer connections to check.

Pritchard tower framework has always been completely pre-fabricated on precision machines for perfect fit. Now, new Pritchard design adds new efficiency, new economy. One *more* reason to choose Pritchard cooling towers!

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COOLING TOWERS
AIR COOLED HEAT EXCHANGERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES IN PRINCIPAL CITIES FROM COAST TO COAST

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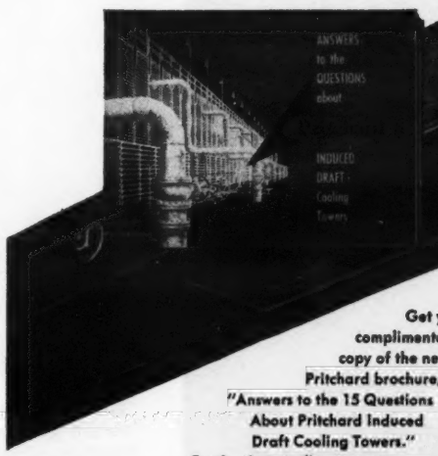


Get your complimentary copy of the new Pritchard brochure, "Answers to the 15 Questions About Pritchard Induced Draft Cooling Towers." Fascinating reading to anyone interested in learning more about cooling towers. Your copy awaits — write for it today on your company letterhead.

The raised ring around the circumference of one end of the Pritchard connector casting matches the ring groove in the framework member. Thus, stress or strain is never on the bolt, but is evenly distributed over the entire area of the ring.

New applications sought for glass-reinforced plastic tape . . .

originally developed for use on weather balloons

Industrial uses for glass-reinforced polyethylene tape are being sought. Tape was originally developed to reinforce plastic panels of weather balloons used to explore stratosphere. Only other applications known to date are for edge reinforcement of woven wire and silk screens, and for reinforcing lightweight plastic tarpaulins.

Tape is available in either pressure-sensitive (No. 875) or non-pressure-sensitive (No. 877) forms. Former has glass filaments sandwiched between polyethylene

Glass-reinforced polyethylene tape is tough, is available in either pressure-sensitive or non-pressure-sensitive forms

and adhesive and has tensile strength of 150 lb per inch of tape width. It has a thickness of 9 mils and grips immediately.

Non-pressure-sensitive tape has the filaments sandwiched between two layers of polyethylene. It has tensile strength of 100 lb per inch of tape and thickness of 11½ mils. Tape is activated by temperatures from 275-600°F, and adheres within 10 to 30 seconds under normal hand pressure.

Backing of tape is resistant to most chemicals with exception of hot xylene. Material is flexible at −60°F.

MOTOR FACTS ON INDUSTRY'S
MOST PREFERRED "POWER PACKAGE"

Electrical System Fact—Only the new Life-Line "A" motor gives you the unsurpassed corrosion-resistant protection of exclusive new Bondar, Bondite and Mylar* insulations.

*Du Pont Registered Trade-Mark

FACT:

The new Life-Line A is the most corrosion-resistant motor on the market

The corrosive action of chemicals takes a heavy toll on conventional motors. The new Westinghouse Life-Line® "A" motor offers more protection against corrosive atmospheres than any other motor you can buy. How?

Because the combined improvements in insulation, housing and bearing design give unsurpassed protection against any contamination. It takes the right combination of such improvements in *all three systems*—electrical, mechanical and lubrication—to make the Life-Line "A" industry's most preferred power package.

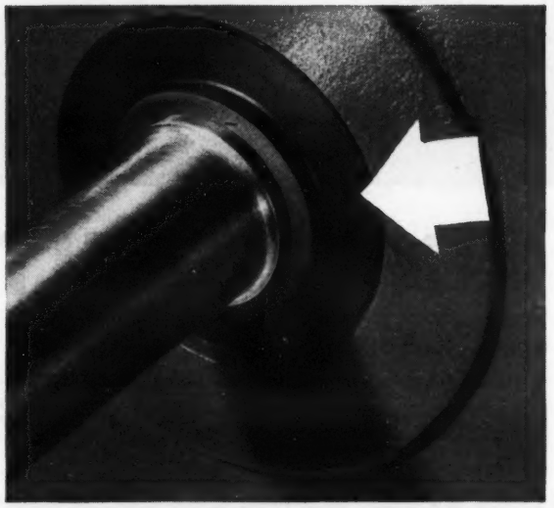
Get all the facts by calling your Westinghouse sales engineer . . . *The Man With The Facts.*

J-21881

YOU CAN BE SURE . . . IF IT'S

Westinghouse

Mechanical System Fact—New cast-iron frames and brackets utilize the finest grained castings with uniformly thick wall sections precisely fitted and sealed. Molded glass plastic cooling fans on totally-enclosed types are chemically inert.



Lubrication System Fact—The new pre-lubricated Life-Line "A" bearing features a "4-way seal"—*two* seals on each side. Totally-enclosed types have additional neoprene flinger which assures bearing protection in any corrosive application.

Tape can be made on standard 72-yard rolls in widths from ¼ to 21 inches for the 875 tape, and ¼ to 34 inches for the 877.

(Glass-reinforced polyethylene tape is product of Minnesota Mining and Manufacturing Company, Dept. CP, 900 Fauquier Street, St. Paul 6, Minnesota . . . or for additional information concerning manufacturer's product, reader may simply check CP 6792 on handy form opposite last page.)

Gamma radiation method vulcanizes rubber . . .

eliminates need for heat-treating, chemical additives

New process for vulcanizing natural and synthetic rubber uses gamma radiation in place of conventional chemical and heat-treating methods. Method is reported to produce vulcanization equal or superior to that achieved by former methods. No residual radiation has been detected in the vulcanized compounds.

In general, intensity of gamma radiation from a cobalt-60 source governs degree of vulcanization in terms of time of exposure and type of rubber.

At present, process seems most promising for vulcanizing rubber for specialized uses, such as producing high-temperature, oil-resistant rubber compounds, and for improving low-temperature serviceability of rubber. Process was perfected by ARDC's Wright Air Development Center.

(Information presented above is through the courtesy of Headquarters, Air Research and Development Command, Office of Information Services, Box 1395, Baltimore 3, Maryland.)

For more information on product at left, specify CP 6793 . . . see information request blank opposite last page.

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of your material

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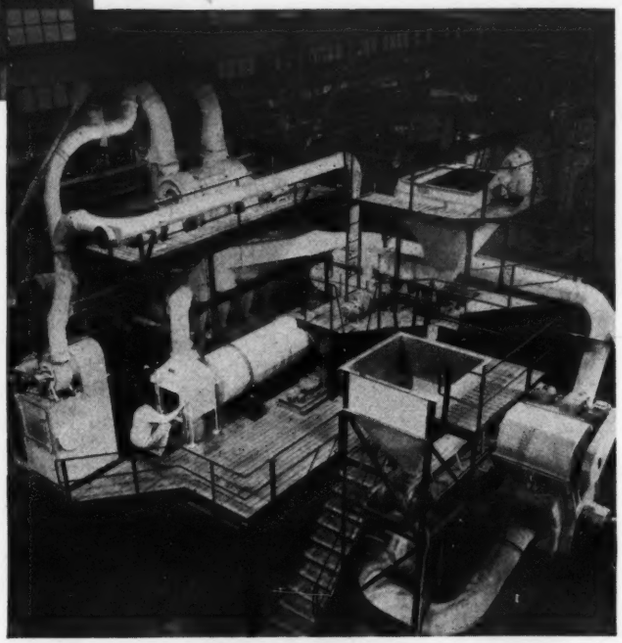

In fully-staffed, modern laboratory, miniature equipment is used to test small batches sent to Link-Belt.

Full-scale facilities are used for large runs. Over 1000 of these tests have been made, on more than 100 products.

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We'll work out drying, cooling or roasting procedures for you

WHAT'S the best drying, cooling or roasting method for processing your materials? Hundreds of plants throughout the world have found an exact, detailed answer through Link-Belt test runs. Here's how it works:

- You send a representative sample of your product — a pound or a ton — with a complete description . . . covering initial moisture, critical temperatures and your merchandising objectives.
- On equipment like that shown above, our specialists conduct test-runs — find how to blend, compound or convert it to desired chemical composition. Our analytical laboratory will determine needed catalyst or agents to be added, if tests so indicate.
- With probable efficiencies decided, we'll lay out flow charts of methods you can follow in your own plant.

If shipping your product is impractical, we'll gladly set up a pilot unit on loan at your plant. Write or send samples to LINK-BELT COMPANY, 300 West Pershing Road, Chicago, Ill.

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13,792

When inquiring check CP 6794 opposite last page

Dye penetrant inspection method checks major plane components in aircraft plant . . .

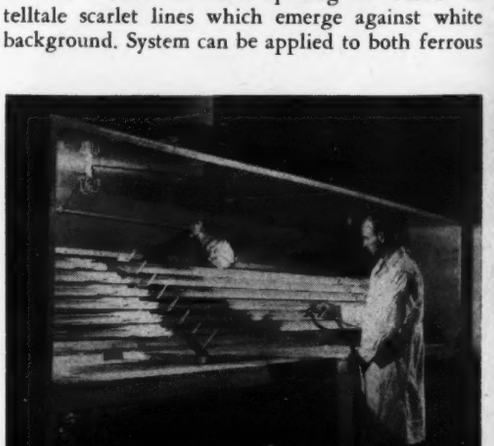
red dye indicates presence of cracks, flaws; process works on ferrous, non-ferrous metals

Dye penetrant method of inspection is used at Northrop Aircraft, Inc., Hawthorne, California, for production line inspection of major components for military planes. Originally developed

Overall view of inspection facility. Parts are carried in baskets by overhead crane system

by Northrop, process depends upon the controlled use of a red dye, together with other liquids, to indicate presence in metal of cracks or other flaws too small to be seen even with the use of a magnifying glass.

When applied to surface of suspected metal, process causes crack or other opening to "bleed" in telltale scarlet lines which emerge against white background. System can be applied to both ferrous



Dye mark developer spray booth. Flaws will show up as scarlet "bleed"

and non-ferrous metals. Important phase of process is the complete degreasing of parts before they are run through system. Without pre-cleaning, foreign matter would give false indications.

Parts are carried in large baskets by overhead crane system, and are dipped progressively in dye penetrant, dye remover, and spray tank. From there, they are lowered into a drying oven, then removed from basket and transferred to racks in spray booths, where operator applies dye mark developer. Only two men are needed to handle process on each shift.

(Dy-Chek process is manufactured by Turco Products, Inc., Dept. CP, 6135 S. Central Avenue, Los Angeles, California.)

Chemical costs cut 31 per cent by using reagent feeders in water plant . . .

provide accurate and effective flow control, eliminate pump breakdowns

Chemical costs have been cut 31% at the City of Opa Locka, Florida, water treatment plant by replacing pumps with small chemical feeders. The two feeders have not only paid for themselves through elimination of wasted chemicals during first four months of operation, but have also eliminated costly maintenance and breakdowns.

Mixture of ammonium sulfate with approximately six times as much sodium silicate by weight was formerly pumped into aeration tank of system to precipitate suspended solids. Mixture was fed at about one ounce per 20 gal of water. Difficulty was experienced in adjusting system since it was hard to know exactly how much was being pumped. In addition, settings tended to stray, and the abrasive nature of substance caused considerable pump wear which resulted in further deviations. Quote of $109.00 to repair pump after last breakdown induced operating engineer to look for a more economical chemical feeder.

Two chemical feeders, priced slightly more than cost of repairing pump, now inject flocculating mixture at constant controlled rate without pumping. Rate settings can be made with needle valve in feeder's body and flow rate is read on graduated metering tube. Only small flow of water (about 1 to 2½ gpm) is required to operate unit. Water is introduced at top, creating a vacuum across jet nozzle. Vacuum lifts mixture through inlet at bottom right (see photo). Jet nozzle also mixes additive with water and ejects solution from outlet (lower left) to aeration tank.

During typical month which feeders were in use, 2071 lb of sodium silicate ($74.56) and 368 lb

(*Continued on next page*)

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. . . the special alloys that make good where other metals fail

HERE are some of the properties of Ampco Metal that help you keep production up, costs down:

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Because it combines all of these qualities, Ampco Metal is often called The Metal Without an Equal.

No matter what you do — whether you work in the chemical or process industries, refine oil, run a steel mill, make stampings, generate power, or any of hundreds of other jobs, you can make Ampco Metal work for you. It saves operating headaches and production grief, because it often makes good where other metals fail.

These versatile special alloys fight wear, corrosion, impact, fatigue; give long life and dependable performance under the severest conditions. That's why they are widely used in such tough assignments as fractionating towers, exchanger components, slippers and screw-down nuts for blooming mill service, aircraft parts, dies, valves, bushings, and other punishing jobs.

Chances are Ampco Metal can help you, too. It's available in sand and centrifugal castings, sheets, plates, bars, tubes, extrusions, welding wire and electrodes. Consult your nearby Ampco field engineer or write us for full information.

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PR-16

When inquiring check CP 6795 opposite last page

Heavy fluids can't hinder working parts in these CRANE VALVES

THIS CASE HISTORY tells how the United States Playing Card Co., Cincinnati, solved—with Crane Diaphragm Valves—a costly problem of piping heavy enamels for paper coating.

The trouble was in the plug cocks and conventional gate valves formerly used in the enamel lines. During normal shutdowns the heavy liquid would build up on seating surfaces, in stem threads and working parts. The cocks and gates would "freeze up" . . . were hard to operate . . . couldn't be shut tight. The condition hampered production . . . made floors messy and dangerous . . . pushed maintenance costs sky-high.

Replacing with Crane Packless Diaphragm Valves stopped the trouble completely. Their sealed-to-fluid bonnet and pliable neoprene disc insert did the trick. After more than 4 years, all 48 Crane valves installed—with no maintenance whatsoever—are still seating tight . . . still operating freely and smoothly.

CRANE PACKLESS DIAPHRAGM VALVES

Working parts are safely out of contact with line fluid. The diaphragm seals the bonnet—that's all it does, giving it longer life. The independent disc with pliable insert seats tightly on foreign particles or seat deposits . . . and controls fluid, even should diaphragm fail. See your Crane Catalog or Crane Representative for wide selection of body, bonnet, and trim materials in these valves for countless uses.

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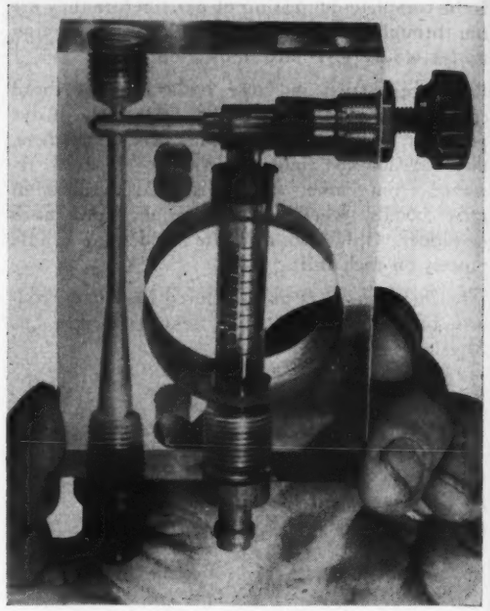
CRANE'S FIRST CENTURY . . . 1855-1955

When inquiring check CP 6796 opposite last page

(*Continued from preceding page*)



Chemical feeder injects flocculating mixture into water treatment system at constant controlled rate

of ammonium sulfate ($34.96) were fed to 21 million gal of water at cost of $109.52, or $5.21 per million gal. Old method used to cost about $7.14 per million gal.

(Feedrators are product of Fischer and Porter Co., Dept. CP, 400 County Line Road, Hatboro, Pa. . . . or for more information check CP 6797 on handy form opposite last page.)

Blanket method of insulation reduces turbine inspection downtime period . . .

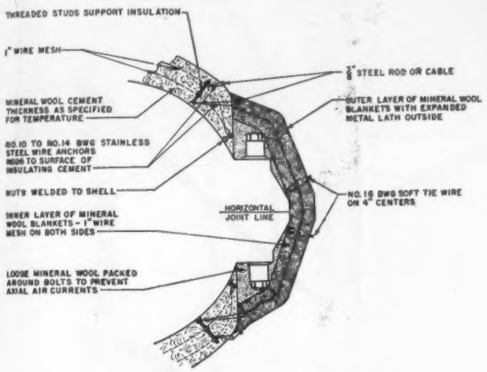
covering comes off in sections, can be stored and quickly replaced

Blanket method of turbine-flange insulation reduces operating-time loss when machine is shut down for inspection. One of most annoying headaches faced in internal inspection of turbines has been the excessive time involved in removing and replacing thermal insulation on the horizontal flanges. In addition to cost of man-hours involved, as many as four days are sometimes lost while machine is being re-insulated.

Blanket method does not disturb insulation and requires only the cutting and replacement of wires. As in conventional techniques, the turbine shell itself is covered with insulating cement (several layers of mineral wool cement separated by one-inch wire mesh. Covering is beveled down

on both sides of flange). A ⅜-inch steel rod or cable is extended along each beveled edge parallel to flange and is held in place by stainless steel wires from threaded studs welded to turbine shell, to secure the one-inch wire mesh.

Mineral wool blankets, usually the 24 x 96-inch (standard) size, are cut and shaped to fit over flange and are secured with soft tie wires to the steel rods on either side. Flange is insulated with two layers of blanket insulation secured in same manner to two sets of rods. Inner layer has one-


THREADED STUDS SUPPORT INSULATION
1" WIRE MESH
⅜" STEEL ROD OR CABLE
MINERAL WOOL CEMENT THICKNESS AS SPECIFIED FOR TEMPERATURE
OUTER LAYER OF MINERAL WOOL BLANKETS WITH EXPANDED METAL LATH OUTSIDE
NO.10 TO NO.14 BWG STAINLESS STEEL WIRE ANCHORS WELDED TO SURFACE OF INSULATING CEMENT
NUTS WELDED TO SHELL
NO.16 BWG SOFT TIE WIRE ON 4" CENTERS
HORIZONTAL JOINT LINE
INNER LAYER OF MINERAL WOOL BLANKETS - 1" WIRE MESH ON BOTH SIDES
LOOSE MINERAL WOOL PACKED AROUND BOLTS TO PREVENT AXIAL AIR CURRENTS

Cross-section illustrates blanket method of turbine flange insulation

inch wire mesh on both sides, while outer layer is applied with wire mesh on inside and facing of expanded metal lath on outside. Since turbine shell is covered with sheet metal housing, no finish is installed over blanket insulation.

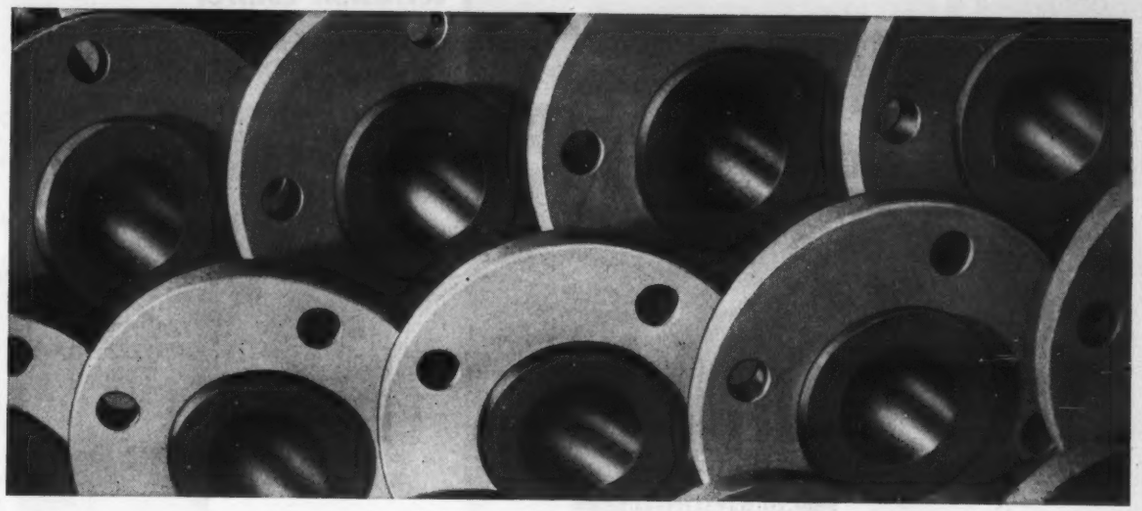
Because blanket insulation is more efficient, smaller thicknesses are equally effective in the normal turbine operating range of 900 to 1100°F. Considering both relative thermal conductivity and average temperature at flanges, blanket thickness has been roughly assumed as 60% of specified maximum thickness of insulating cement on hottest section of turbine shell.

Flange insulation is removed simply by cutting tie wires to steel rods and those attached through insulation to the expanded metal lath facing the outside. Covering is lifted off and stockpiled near turbine in several large sections during inspection period.

(Information courtesy Industrial Mineral Fiber Institute, Inc., Dept. CP, 441 Lexington Avenue, New York, New York.)

Make short work of gas volume problems—
see nomograph on pages 200 and 202.

DOW



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GIVES LONG, TROUBLE-FREE SERVICE

It's made of corrosion-resistant saran pipe swaged into steel for extra rigidity and strength . . . cuts downtime losses conveying corrosive liquids.

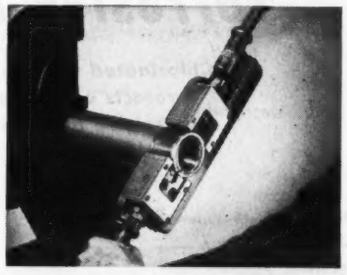
Now you can convey chemicals and many other corrosive liquids without worrying about costly shutdowns due to corrosion. For saran lined pipe, fittings and valves are corrosion-resistant . . . form snug, leakproof joints . . . which won't burst up to 150 pounds working pressure.

They're easily and inexpensively installed because they can be cut and threaded in the field with any standard pipe fitter's tools. Their rigidity means that few supporting members are needed.

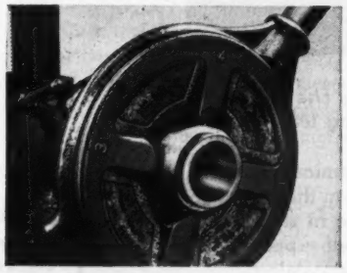
Saran lined pipe, fittings and valves have a proved record in industry of bringing long trouble-free service. If your operation requires superior resistance to most chemicals and solvents, be sure to investigate saran lined pipe. Contact the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Michigan, Department SP527B-1.

RELATED SARAN PRODUCTS—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

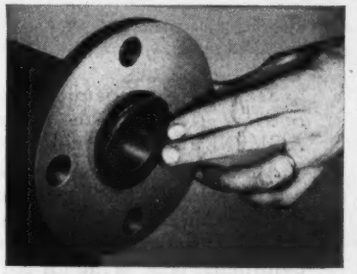
Saran Lined Pipe Can Be Fabricated Right in the Field!



An adapted Beaver Cutter cuts away the end of the steel pipe so that ⅛" of the saran lining is extended. This assures a tight seal after a flange is applied and connected with another flange.



A ratchet type thread cutter makes the standard threads after the Beaver Cutter has been used. A flange or union fitting is attached and tightened until the liner is flush with the fitting.



If two flanges, or a union fitting, are used to make a pipe connection then a full gasket is required. If a flange is made up against a flange fitting or spacer then a half gasket is required.

Saran Lined Pipe is Manufactured by
The Dow Chemical Company, Midland, Michigan

you can depend on DOW PLASTICS

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improved non-corrosive plastics for fabrication of chemical processing equipment
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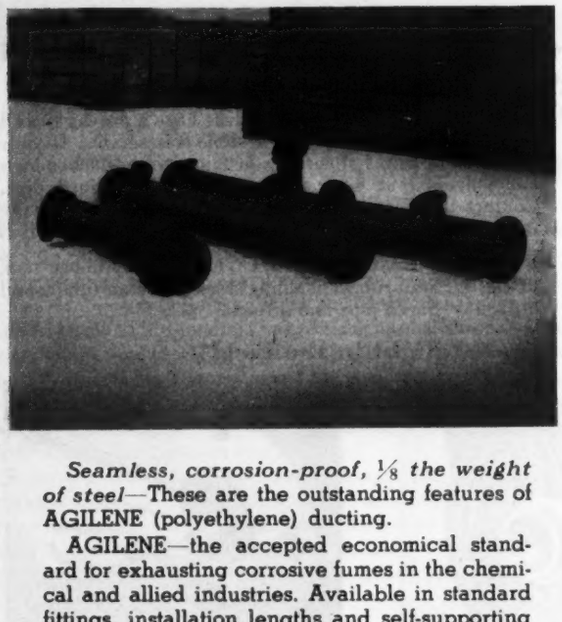
Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE — fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



Seamless, corrosion-proof, 1/8 the weight of steel—These are the outstanding features of AGILENE (polyethylene) ducting.

AGILENE—the accepted economical standard for exhausting corrosive fumes in the chemical and allied industries. Available in standard fittings, installation lengths and self-supporting centrifugal fans. Write for our latest catalog.

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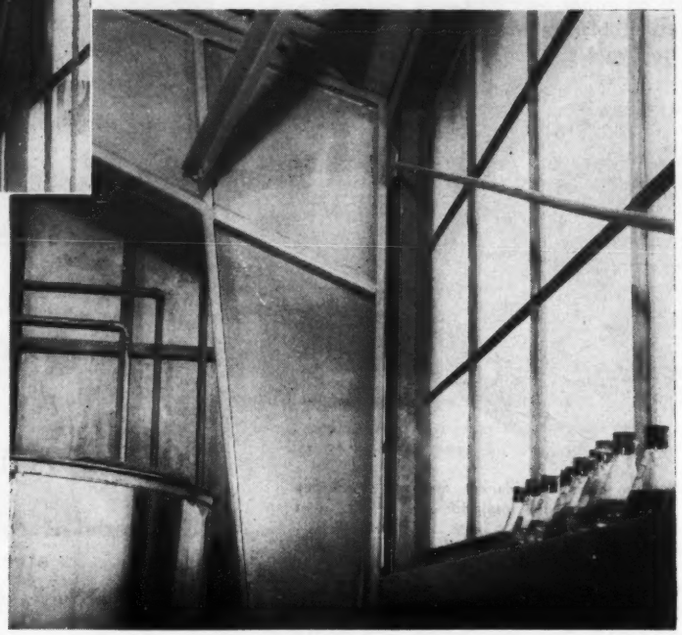
DEPT C-1

When inquiring check CP 6799 opposite last page

Fig 1—One of coatings used formerly, shown after 22 months wear. Arrow points to structural failure in lower fan brace where corrosive atmosphere has eaten through coating and metal

Fig 2—Chlorinated rubber-base coating shown after 18 months wear in same environment. Note excellent condition of coating



Iodine may guard against infection when used, but when it's made, the processor's plant needs a coating which —

guards against corrosive iodine fumes

Chlorinated rubber-base enamel successfully protects equipment in highly destructive atmosphere at Deepwater Chemical Company

EDGAR B. WITMER, Plant Superintendent
Deepwater Chemical Company
with **ROY HELSING,** Assistant Editor

Problem: The processing of salt water, from nearby oil wells, to produce iodine creates a highly corrosive atmosphere in the plant of Deepwater Chemical Co., Compton, Calif. Coatings needed to protect equipment in the plant must be able to withstand such corrosives as concentrated iodine solutions, potassium iodide, free iodine in solution and vapors, chlorine vapors, sulfuric acid solutions and fumes, some hydrogen sulfide vapors, carbon dioxide, and, of course, a moisture-laden atmosphere.

Equipment wasn't getting much protection from various coatings and enamels that were tried. In each case, failure of coating was so rapid that it was considered impractical.

Solution: About five years ago, Deepwater began using a chlorinated rubber-base enamel to protect equipment from the destructive atmosphere.

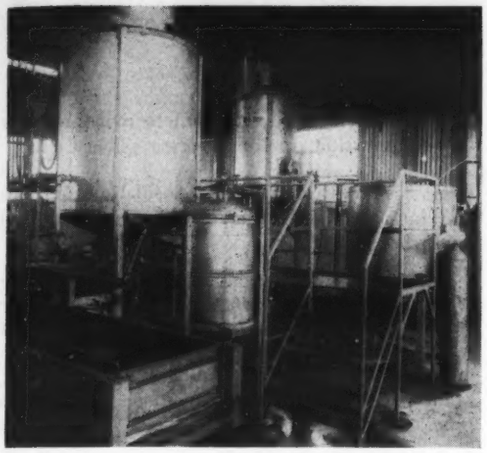


Fig 3—All surfaces in this Conversion Room, excepting stainless steel tanks, are protected by chlorinated rubber-base coating

This enamel, which gives an attractive finish, shows excellent resistance to alkalis, acids, and moisture.

Application of enamel was made over a minimum surface preparation for the elements involved. Since sandblasting was impossible, surface was merely wire brushed and given a wash of 15% phosphoric acid and inhibitor. Over a prime coat, two finish coats of rubber-base enamel were then applied.

Results: Chlorinated rubber-base coating has provided an average of 18 months service life in the "toughest" spots in the plant. Protection for this long is excellent considering the highly corrosive conditions. Of course, longer service is attained where the atmosphere in the plant is less damaging. Enamel has shown excellent adhesion despite minimum surface preparation prior to application.

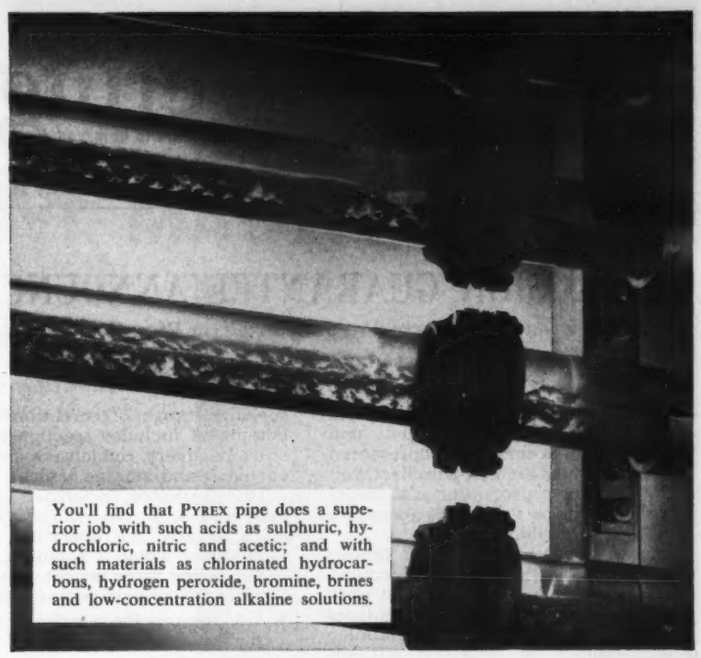
(Valdura chlorinated rubber-base enamel is a product of Valdura Div., American-Marietta Co., Dept. CP, 101 E. Ontario St., Chicago 11, Ill. . . . or check CP 6800 on handy form opposite last page.)

(Parlon chlorinated rubber on which coating is based is a product of Hercules Powder Co., Dept. CP, 940 Market St., Wilmington 99, Del. . . . or check CP 6800A on handy form opposite last page.)

For better ways to whip corrosion . . .

. . . try the handy Product Directory (starting this issue on page 214). You'll find it an easy "page-locator" for ideas, materials, and services.

Are you missing the **corrosion resistance** *of* **PYREX®** *pipe because you think it will break?*



You'll find that PYREX pipe does a superior job with such acids as sulphuric, hydrochloric, nitric and acetic; and with such materials as chlorinated hydrocarbons, hydrogen peroxide, bromine, brines and low-concentration alkaline solutions.

One plant manager describes his experience with PYREX pipe this way: "There was no breakage during installation. There have been no lines broken because of the product handled, the temperatures involved, or the age of the pipe. There has been no accidental breakage. In short—there has been *no breakage*."

Every "product" line in this manager's plant has been PYREX pipe since 1943. The company switched to PYREX pipe because metal lines were quickly corroded by product acids. Corrosion in the metal piping also made cleaning difficult. Frequent replacements made maintenance very costly.

Engineers and operating men in hundreds of processing plants make similar "no breakage" reports about millions of feet of PYREX brand glass piping in use today. If you are not enjoying the trouble-free corrosion resistance of PYREX pipe because you are worried about breakage, why not talk to people who use it daily. We shall be pleased to furnish names.

You can install it easily

Over 75% of the PYREX pipe now in use has been installed by our customers' own pipe fitters. It is easier to hang than many other kinds of corrosion resistant pipe. There are no special hard-to-catch-onto tricks about it. Our installation manual covering every detail is yours for the asking.

Now more durable

To offset strain, all PYREX pipe ends and fittings (except U-bends) are now tempered, which makes them much stronger than annealed fittings. They are strong enough to drive nails with.

Cuts maintenance problems

The liquid-smooth surface of PYREX pipe does not pit. It stays cleaner longer. When cleaning is necessary, it is easy; for you can see the interior of the pipe at all times.

One plant superintendent said, "Since PYREX pipe was installed for all of our product lines, maintenance has been practically nil."

What does it cost?

Initial cost of PYREX pipe compares favorably with most other corrosion resistant piping . . . is lower than some. Low installation and maintenance cost and long-time service put PYREX pipe far on the economy side of your plant budget.

More information for you

For more information to help you judge the advantages of PYREX pipe, let us send you any or all of the bulletins listed in the coupon below. Or, if you prefer to discuss your own specific problem immediately with one of our representatives, write, wire or phone us.

CORNING GLASS WORKS, CORNING, N. Y. *Corning means research in Glass*

CORNING GLASS WORKS, 35 Crystal Street, Corning, N. Y.

Please send me the bulletins checked below:

- ☐ EA-1: "PYREX brand glass pipe in the Process Industries" (Illustrated case histories)
- ☐ EA-3: "PYREX brand 'Double-Tough' Glass Pipe and Fittings"
- ☐ PE-3: "Installation Manual for PYREX brand 'Double-Tough' Glass Pipe"
- ☐ Please have your representative call on me.

Name ..... Title .....

Company .....

Street .....

City ..... Zone ..... State .....

When inquiring check CP 6801 opposite last page

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N.Y.

CORROSION GUARANTEE ANNOUNCED!

Now—a year's corrosion guarantee on Pfaudler vessels used in processes containing hydrochloric acid!

If your product has hydrochloric acid as its principal corrosive agent, and you operate in the range represented by the darkest area on our chart, you can now have processing equipment which carries a full year's guarantee against corrosion!

If chemical attack should render your Pfaudler glassed steel equipment unusable within its first year of use under the operating conditions specified in the guarantee, Pfaudler will replace or repair it without charge by on-the-spot methods or on an F.O.B. factory basis.

You receive this guarantee on all glassed steel equipment supplied with Pfaudler acid-alkali-resistant glass, when it is expressly purchased for processing hydrochloric acid in the specified range of conditions. Such equipment includes reaction kettles, stills, receivers, condensers, heat exchangers and storage tanks.

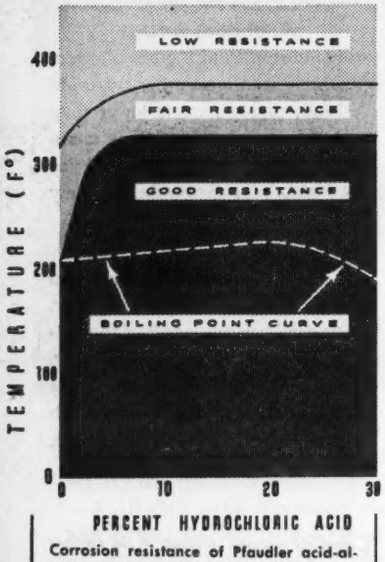
The guarantee, in written form, is delivered with the equipment, and states clearly the operating conditions under which it applies.

You'll find three important advantages in this unique guarantee:

1. It minimizes the possibility of major shutdowns caused by corrosion of equipment.
2. It frees you from large maintenance or replacement costs.
3. It assures you that the glassed steel equipment you buy is *matched to your process,* selected for its special resistance with reference to *your* product.

Perhaps you have a problem right now, for which this guaranteed corrosion-resistant equipment offers a solution. Call in your Pfaudler representative and discuss your needs with him.

Or write for Bulletin 205, "Glassed Steel—Its Resistance to 92 Corrosives, Forms Available and Applications."



Corrosion resistance of Pfaudler acid-alkali-resistant glass by hydrochloric acid.

For concentrations and temperatures in darkest area, glassed steel equipment is guaranteed against corrosion. In the "fair resistance" and "low resistance" areas, Pfaudler glassed steel may often be the most resistant material of construction available to you at *reasonable* cost. To make this decision, Pfaudler should be consulted, and tests may be run in either your plant or at the Pfaudler laboratory.

Glassed Steel Long Used For Tough Corrosive Problems

Field data which form the basis for Pfaudler's new guarantee against corrosion has been compiled from thousands of installations, such as these glassed steel reactors in use at Distillation Products Industries. Pfaudler glassed steel units have solved problems of corrosion since 1884, are continually being improved to meet new demands of higher temperatures and pressures.

Three reasons why you can now get this unusual anti-corrosion guarantee

Like all Pfaudler chemical processing equipment, glassed steel *always* has been guaranteed from the standpoint of workmanship.

But why is it that you can now get a *corrosion* guarantee—a written agreement that your equipment will hold up under corrosive attack for at least a year?

Reason No. 1 is the glass itself. Pfaudler's new acid-alkali-resistant glass, now standard on chemical processing equipment, is a special type of glass which not only resists most acids, but also can be used for alkalies up to pH 12 and 212° F.

Reason No. 2 is the sensible approach to a specific problem by corrosioneers. We know what glassed steel can do, *and* what it can't. Field and laboratory data provide the background for deciding between glassed steel and other materials.

Reason No. 3 is our general policy on the equipment we sell. During its fabrication, we inspect it carefully at several check points. No vessel for severe chemical service leaves the factory until every square inch inside has been given a spark test to make sure the glass completely covers the steel to a certain minimum thickness.

12-MONTH GUARANTEE against corrosion is now offered with Pfaudler glassed steel equipment for processing a number of specific chemicals; hydrochloric acid, discussed in this article, is one of them. Other products which are covered under this unique guarantee will be discussed in future issues of *Corrosioneering News.* Watch for them.

When inquiring check CP 6802 opposite last page

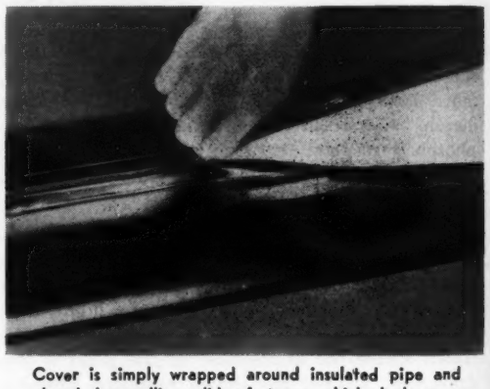
Installation and maintenance easy with plastic insulation cover that "zips-on" . . .

material is highly resistant to moisture-vapor transmission, mold, mildew

Uses: Protecting thermal insulation on pipe and ducts against weather, abrasion, moisture, and most chemicals.

Features: Cover is easily installed and economically maintained. It is simply wrapped around insulated pipe and closed by pulling a slide fastener which locks preformed edges together. Slide fastener device, which is an integral part of cover, holds cover in place and completes seal around pipe.

End joints or fittings in line are wrapped tightly with tape made of same plastic, which is lapped over itself and the ends of the covers. A coating based on vinyl resin is brushed on to seal the fitting cover.



Cover is simply wrapped around insulated pipe and closed by pulling slide fastener which locks preformed edges together

Description: Thermal insulation cover is prefabricated of Krene plastic (a product of Bakelite Co., a Division of Union Carbide and Carbon Corp.)

Plastic is flexible, durable and highly resistant to moisture-vapor transmission, mold, and mildew. Installed at low labor cost, cover provides ready access to pipe at any point without damage to cover. It can be used on insulated pipe indoors or outdoors, underground in a steam-distribution system of conduits, or on low-pressure building heat supply lines. Covers are available in black or colors, to cover insulated pipe from ½ to 33" in diameter, and in lengths up to 100'.

(Protektinsul thermal insulation covers are produced by Miracle Adhesives Corp., Dept. CP, 214 East 53rd St., New York 22, N. Y. . . . or for more information reader may simply check CP 6803 on the convenient Reader Service slip which is located opposite last page.)

How aluminum controls corrosion in the chemical industry

Comprehensive 84-page booklet describes how aluminum controls corrosion and provides other desirable properties in a wide variety of applications in the chemical industry.

Booklet contains many photographs of actual plant installations in petroleum, petrochemical, chemical, food, and drug plants. One section of considerable interest covers the chemical resistance of aluminum to many commonly used chemicals. Tabular material is also presented on the properties of different aluminum alloys.

Form AD 460 can be obtained on letterhead request from Aluminum Co. of America, Dept. CP, 1501 Alcoa Bldg., Pittsburgh, Pa.

Is corrosion licking you?

Then be sure to see July CP . . .

The feature section carried in December on Corrosion Control aroused such enthusiasm in our readers that we are planning to feature this subject again in July. In fact, we plan to highlight our regular monthly Corrosion Control section annually in view of the tremendous interest in this field.

How other plants have licked their corrosion problems will be told in performance stories. Latest developments in materials and equipment will be presented . . . plus a host of other topics. Remember July CHEMICAL PROCESSING for answers to corrosion problems!

Editorial balance will be maintained, with other sections of CP appearing as always.

At last!

A TRUE VINYL MASTIC!

Complete protection in a single coat—10 mils thick.

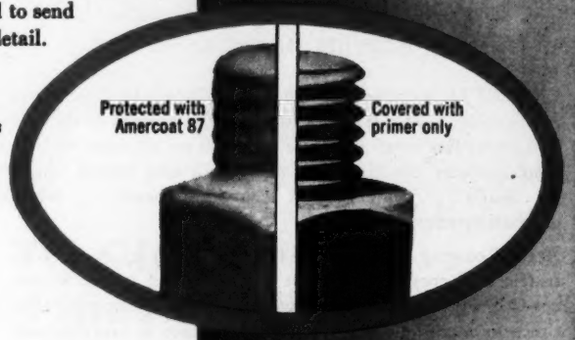
Amercoat No. 87 will cut your maintenance costs because one coat gives you the thickness and protection previously available only through the application of multiple coats.

Amercoat No. 87 is the brand new solution to an old problem, for it combines the time-tested chemical and weather resistance of a vinyl with the extra thickness that was heretofore available only in conventional mastics.

Amercoat No. 87 is easily applied with standard industrial spray equipment. Only one cross-spray coat, over a primed surface, is required for complete protection. Because **Amercoat No. 87** is a true vinyl, it is not limited to black, but is available in a variety of colors.

You can save up to 50% of your labor costs with **Amercoat's new vinyl mastic No. 87.** We will be pleased to send you a bulletin describing this new coating in detail.

Notice that the sharp bolt threads, welds and sharp corners are completely protected with one coat of Amercoat No. 87—10 mils thick!



Amercoat CORPORATION
Dept. PE,
4809 Firestone Blvd.,
South Gate, California

EVANSTON, ILL. • KENILWORTH, N.J. • JACKSONVILLE, FLA. • HOUSTON, TEX.

When inquiring check CP 6804 opposite last page

Ceilcrete

a stonelike acidproof coating for floors, walls, tanks, trenches . . . provides superior protection for concrete surfaces

CEILCRETE is chemically equal to acidproof brick in many applications . . . yet it can be applied at a fraction of the cost and in far less time! It can be troweled on all types of concrete surfaces: flooring . . . pipe, tank and trench lining . . . walls . . . cement block . . . pump bases . . . waste disposal systems.

A thin coating of CEILCRETE withstands trucking, foot traffic and erosion from hot solutions and steam. Floors covered with CEILCRETE have load carrying capacity four times greater than plain concrete! Surface is nonslip, and CEILCRETE "B" has the added feature of being sparkproof.

Only CEILCRETE has maximum resistance to acids, alkalis and solvents as well as to abrasion and heat. It adds no weight to floors and does not noticeably raise the elevation.

CEILCRETE materials can be supplied ready for installation, or a complete job can be done on a contract basis. Available in black and colors.

For complete details and specifications, write today for Bulletin 110.

1859-CC

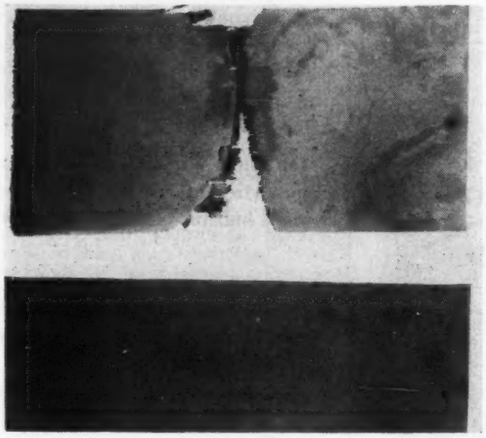
THE CEILCOTE COMPANY
CORROSIONPROOF MATERIAL AND CONSTRUCTION

4834 RIDGE ROAD CLEVELAND, OHIO

When inquiring check CP 6805 opposite last page

Hot nitric-hydrofluoric acid resisted by Type 329 stainless steel

After encountering a severe corrosive action on equipment being used in plating operations, an eastern manufacturer tried Type 329 stainless steel, which was found to offer excellent resistance to corrosive attack of certain nitric-hydrofluoric acid solutions. In a production line test, part of each specimen of Type 316 and Type 329 steel was held in the quiescent portion of solution, and part was exposed to aerated condition. Both were exposed to exactly the same medium as that encountered in normal production—a solution of 17% nitric acid and 6½% hydrofluoric acid. They were exposed continuously for 117 days.



While corrosive attack on Type 329 is almost negligible (bottom) nitric-hydrofluoric solution has practically disintegrated Type 316 strip (top)

After this exposure, test samples showed the following corrosion rate in inches penetration per month: Type 316, .0074 ipm; Type 329, .0009 ipm.

(No. 7-Mo stainless steel (Type 329) is a product of The Carpenter Steel Co., Dept. CP, 1937 Palmer St., Reading, Pa. . . . or for more information check CP 6806 on handy form opposite last page.)

Details on phosphor-bronze in thin-gage strip

Details on physical characteristics, temper, mil limits, available thickness tolerances, and applications for thin-gage strips of phosphor-bronze are given in four-page data sheet.

Data Sheet 101 is available from American Silver Co., Inc., Dept. CP, 36-07 Prince St., Flushing 54, N. Y. Specify CP 6807 opp. last page.

SNAPS ON AND OFF THE SHAFT
Quickly and Easily
CHEMPRO *Teflon*
SEAL CAGES*

Flexible Chempro Teflon† Seal Cages, for lubricating or cooling stuffing box packing, snap on and off a shaft quickly and easily. They eliminate the time-consuming job of "pulling" the shaft required when conventional lantern rings are used. Machined in a single piece, they fit snugly, with no movement or vibration, even at very high shaft speeds. Their tough construction prevents bending or collapsing under extreme gland pressure.

Chempro Seal Cages do not score shafts as do two-piece metal lantern rings, eliminating the expense of replacing badly scored shafts.

For corrosive service they are unbeatable, lasting many times longer than metal rings under continuous contact with acids, organic solvents, thionyl chloride, etc., at normal and elevated temperatures.

They are made in sizes to fit any shaft diameter and stuffing box bore.

Write for new Chempro Bulletin on the patented Seal Cage.

THE ORIGINAL FABRICATORS OF TEFLON PACKINGS AND GASKETS

*Patented †duPont trademark

CHEMICAL & POWER PRODUCTS, Inc.
9 Broadway, New York 4, N.Y.

When inquiring check CP 6808 opposite last page

Discusses use of hydrazine in treating feed water

Use of hydrazine in treating feed water for high-pressure boilers is discussed in two-page data sheet. Text details necessity for precise addition of chemical to boiler feed water, which maintains residual oxygen content at zero and prevents ammonia accumulation in the system.

Flow sheet illustrates feed water treatment set-up. Equipment discussed includes a small controlled-volume pump which maintains measured addition of chemical to feed water.

Data Sheet D-54-3 is available from Milton Roy Company, Dept. CP, Station 5A, 1300 East Mermaid Lane, Philadelphia 18, Pa. When inquiring specify CP 6809 on handy form opposite last page.

Many applications expected for liquid Teflon

Uses for liquid Teflon solution are expected to cover a broad field including coatings where a smoother, slipperier non-adhesive surface is required; where perhaps some improvement in chemical protection or electrical insulation is needed; or where a wide range of temperature variation must be tolerated.

Areas coated with solution will have greater resistance to chemical attack, magnitude of resistance being dependent on material coated and thickness of coating. Liquid Teflon will not absorb water and is completely resistant to outdoor weathering. It is non-toxic and can withstand temperatures from −200°F to 575°F.

Any material can be coated, and application is by brushing, dip-coating, spreading with a cloth, spraying, or other methods, depending on job requirement.

(Waxlube liquid Teflon is a product of Dixon Corporation, Dept. CP, Bristol, Rhode Island . . . or for more information check CP 6810 on handy form opposite last page.)

Depicts valves and fittings for pulp and paper use

Alloys and applications, valve selection, design factors, and installation and maintenance of stainless steel valves and fittings in the pulp and paper industry is subject of reprint available from Cooper Alloy Corporation, Dept. CP, 150 Bloy St., Hillside, N. J. When inquiring check CP 6811 on handy form opposite last page.

SANITARY PUMPS
Designed for the non-agitating, efficient pumping of milk, food products such as diced carrots, cream style corn, tomatoes, applesauce, relish and beverage. Also used in breweries and for the pumping of drugs and chemicals in solution. Available in type 304 and 316 stainless steel and nickel alloy.
INDUSTRIAL PUMPS
Designed for pumping latex, water, brine, light oils, chemicals, paints, brewery products and liquids in the food processing field where lines are of I.P.S. type. This model offers quick disassembly features for ease in cleaning. Available in type 304 and 316 stainless steel, bronze and cast iron.
"PUMP KING" SERIES
Designed for very efficient operation at 1800 and 3600 RPM, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. The 3600 RPM model is especially applicable in the dairy industry where high head and low capacity are essential and for handling low and medium viscosity liquids in the food processing industry. Available in both sanitary and industrial types.

These efficient Tri-Clover PUMPS can pump any product that will flow to them . . .

ANY product that will flow to them can be handled efficiently and economically with Tri-Clover non-agitating centrifugal pumps. Illustrated are just three of the many Tri-Clover pump models used extensively in food processing, brewing and bottling, chemical process and general industrial applications. Pumps are available in stainless steel, nickel alloy, bronze and cast iron.

Designed for efficient liquid transmission and low cost maintenance, these pumps have many exclusive features, among which are—patented screw type impellers with quick-acting impeller clips, lightweight heads with a minimum of parts, casing construction permitting fast, easy assembly or disassembly—and a wide choice of seals for various applications, including inert carbon rotary seals for sanitary application, packing gland seals, water cooled seals and seals for latex handling.

Tri-Clover's exclusive developments are the result of many years of specialized engineering experience and thorough knowledge of liquid handling. Let our engineering staff work with you in solving your pumping problems.

See your nearest TRI-CLOVER DISTRIBUTOR

EXPORT DEPT., 8 So. Michigan, CHICAGO, U.S.A.

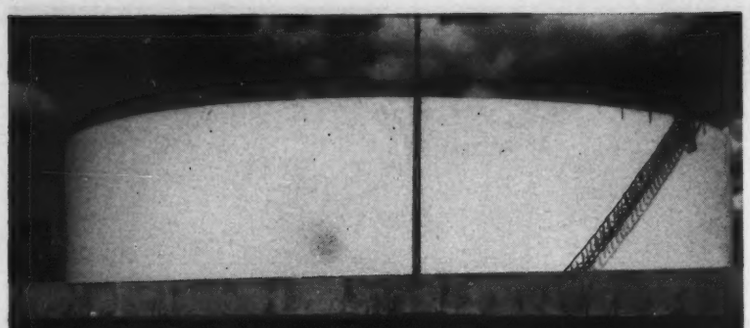
SEND FOR THE TRI-CLOVER PUMP CATALOG — ***One of the most complete, useful pump catalogs ever compiled. Contains engineering data on all types of pump applications. Write for your copy of Catalog 253 today.***

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

TRI-CLOVER

P355

When inquiring check CP 6812 opposite last page



Valdura

TANK-WHITE

was specified on this job
because
Performance and Durability
have been **DOUBLE-TESTED**

in the laboratory...
and on countless jobs

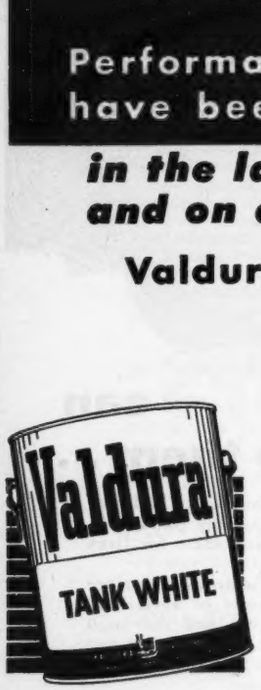
Valdura Tank-White

. . . and every other product in Valdura's complete line of heavy-duty industrial maintenance paints . . . is the product of thorough research in ultra-modern laboratories staffed by hundreds of the finest technicians in the industry.

Your added dividend, when you buy a Valdura product, is that it's

JOB TESTED!

Valdura's years of experience as the leader in the field of heavy-duty industrial maintenance paints, provides case record after case record to prove the efficiency and economy of its produets.



Non-yellowing and self-cleaning

If you'd like to know more about Valdura's complete line of specialized maintenance products, or if you'd like help with a particular problem, just state your wishes on your regular letterhead and mail to the address below. ***Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!***

VALDURA PAINTS THAT ENDURE

VALDURA HEAVY DUTY PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 6813 opposite last page

Permits easy disassembly of threaded joints, perfect seal . . .

Teflon material also highly resistant to corrosion, high and low temps

Uses: Pressure-tight seal in threaded joints.

Features: Compound, based on Teflon, prevents leakage even after joints have been backed off one full turn. It permits easy disassembly of joints in materials that normally cannot be separated without damage, once they have been turned up tight.

Description: Teflon sealing compound is applied as readily as any other. It is adapted for both high and low temperature use, over a range from −200°F up to 550°F. Construction of pipe lines is speeded because compound acts as a lubricant to make pipe-joining easier and faster.

(Dixseel Teflon sealing compound is a product of Dixon Corporation, Dept. CP, Bristol, Rhode Island . . . or for more information check CP 6814 on handy form opposite last page.)

Provides economical protection against acid or alkali fumes and splash . . .

neoprene surfaces easily recoated or repaired by simply-applied coating

Uses: Maintenance protection against most acid and alkali fumes and splash, and high humidity conditions.

Features: Advantage of coating lies in its simplicity of application. No catalysts or accelerators are required. Only wirebrushing of metal surfaces to remove dirt, rust, and scale is necessary.

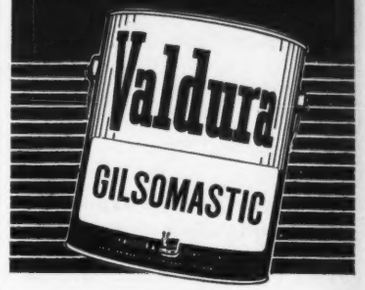
Neoprene surfaces can be easily recoated or repaired with this coating. Bond of repaired section is as strong as original coating.

Description: Following preparation of metal surface, one coat of primer and two coats of this neoprene coating are applied for a final thickness of 8 mils, on either flat or vertical surfaces. Drying time between coats is about 2 or 3 hours and in most cases coated surface can be placed in service after 24 hours.

Coverage of coating is 420 mill feet per gallon (140 sq ft — 3 mil film). Application is by brush or spray and curing takes place at room temperature.

(Neoprene W corrosion-resistant coating is a product of Carboline Co., Dept. CP, 331 Thornton Ave., St. Louis 19, Mo. . . . or for more information check CP 6815 on handy form opposite last page.)

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below. Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.



Just one coat of Gilsomastic provides a tough, durable film ***as thick as eight to ten coats of ordinary paint!*** **It's nature's perfect protection against the elements and industrial fumes because it's made with Gilsonite . . . 99½% pure natural asphalt.**

If you figure maintenance costs in cost per square per year, VAAP is your best buy in an aluminum paint. It's fortified with asphalt . . . it provides better "leafing." It's made for ***heavy duty*** **performance.**

If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!

VALDURA PAINTS THAT ENDURE

VALDURA
HEAVY DUTY
PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 6816 opposite last page

Corrosion-resistant vitreous coating is durable, can be applied to metal at low firing temps . . .

permanently bonded to ferrous surfaces at temps as low as 900°F

Uses: In applications where metal warpage has not permitted use of porcelain enamel on thin gage metals, and where synthetic enamels, galvanizing and exterior-service metals have found wide usage.

Features: Corrosion-resistant, inorganic silicate coatings are durable and can be applied to ferrous metals at temperatures from 900 to 1200°F.

Description: Vitreous coating produces a decorative and permanent protection against corrosion. It is easy to apply and shows excellent scratch hardness and resistance to abrasion. Where corrosion protection is primary aim, coating is available as premilled compound which need only be mixed with water and color oxide to form slurry which is then applied to surface. As with all metal finishing, pieces to be coated must be cleaned. They are then dipped in or sprayed with slurry of coating by any one of a number of conventional methods.

Ware is then charged into a furnace and coating fused by bringing it to temperature specified for the particular coating used, never more than 1250°F. For cast, wrought, and malleable iron, and heavy sections in general, only coating itself need be brought up to fusion temperature.

(For more information on these inorganic silicate coatings, The Porcenells, contact Allied Porcenell, Inc., Dept. CP, 851 S. Market St., Waukegan, Ill. . . . or for more information reader may simply check CP 6817 on handy form opposite last page.)

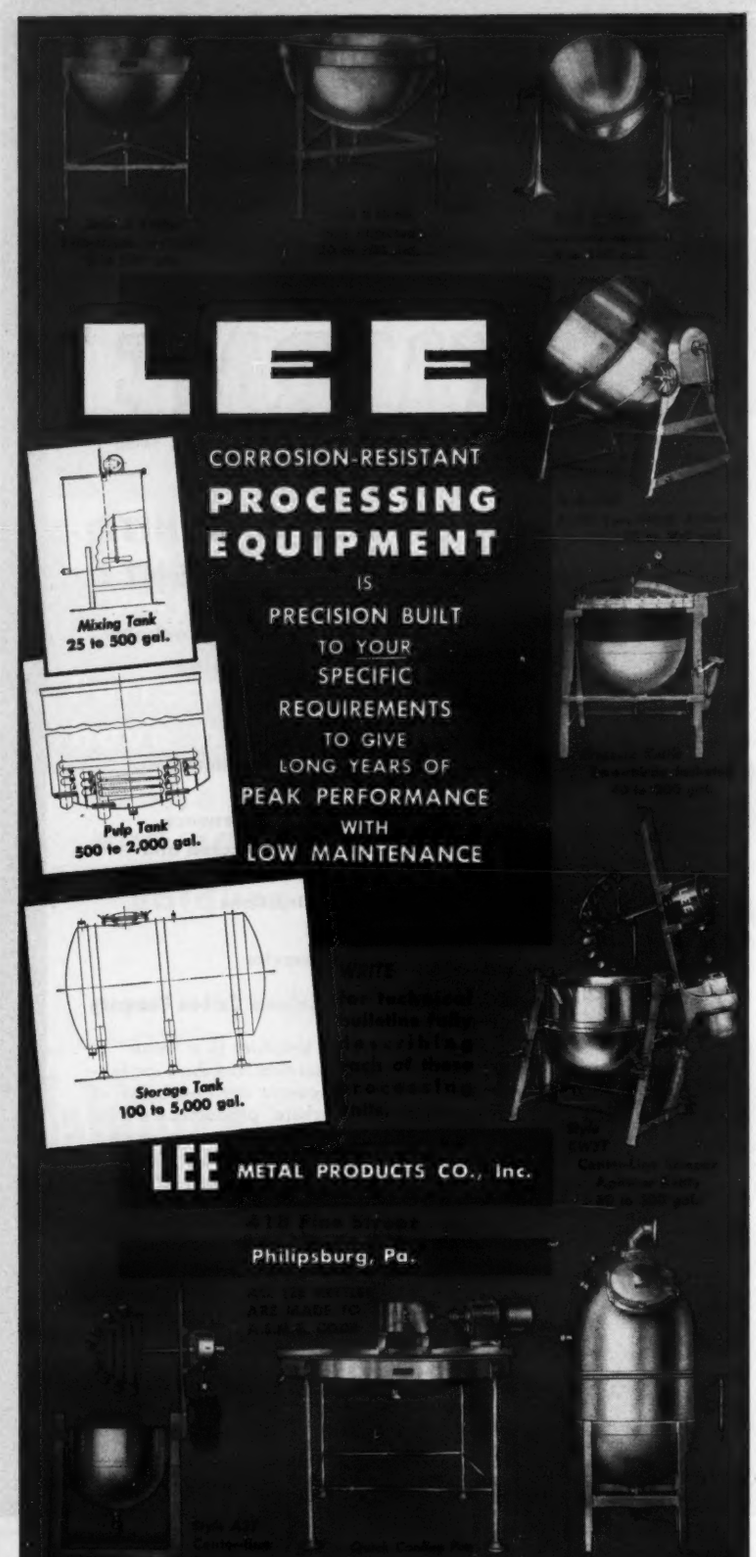
Results of tests with PVC and over 250 corrosives

Various construction forms of company's formulation of rigid PVC are discussed in detail in six-page bulletin. Also included is a listing of over 250 corrosives. Rating system is used to indicate whether or not this plastic construction material is recommended for use with a specific corrosive. Physical and electrical properties of the plastic are listed. Heat-resistance is also discussed.

Bulletin No. 3 is available from Haveg Corp., Subsidiary of Continental-Diamond Fibre Co., Dept. CP, 900 Greenback Road, Wilmington 8, Delaware. When inquiring specify CP 6818 on handy form which is located opposite last page.

We've found that "KARBATE" equipment cuts costs wherever corrosion is a factor!
WHY SHOULD YOU USE
KARBATE
BRAND
IMPERVIOUS GRAPHITE PROCESS EQUIPMENT?
ANSWER: Because only "Karbate" products combine:
• Corrosion resistance
• Immunity to thermal shock
• Freedom from metallic contamination
• High thermal conductivity
• Low first cost and low maintenance
• Workability — readily fabricated and serviced in the field
• Sturdy, durable constructions
• Standard stock units
• Complete technical service
Manufactured Only By National Carbon Company
"Karbate" impervious graphite is a "must" in many highly corrosive services. But these applications only begin to measure the possibility of savings offered by "Karbate" products in a wide range of process locations. Wherever corrosion, contamination or thermal shock must be eliminated, "Karbate" products save time and money all the way down the process line.
WRITE FOR LITERATURE!
The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation
NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.
Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco
In Canada: Union Carbide Canada Limited, Toronto
Pumps — Catalog Section S-7250
Pipe and Fittings — Catalog Section S-7000
Heat Exchangers — Catalog Sections S-8740 and S-8840
Cascade Coolers — Catalog Section S-8820
HCl Absorbers — Catalog Section S-7480

When inquiring check CP 6819 opposite last page


LEE
CORROSION-RESISTANT
PROCESSING EQUIPMENT
IS PRECISION BUILT TO YOUR SPECIFIC REQUIREMENTS TO GIVE LONG YEARS OF PEAK PERFORMANCE WITH LOW MAINTENANCE
Mixing Tank 25 to 500 gal.
Pulp Tank 500 to 2,000 gal.
Storage Tank 100 to 5,000 gal.
LEE METAL PRODUCTS CO., Inc.
Philipsburg, Pa.

When inquiring check CP 6820 opposite last page

CORROSION

Test for copper corrosion by petroleum products with redesigned bomb

To be used for ASTM D 130 "Test for Copper Corrosion by Petroleum Products", redesigned test bomb eliminates many objectionable features of bomb formerly used.

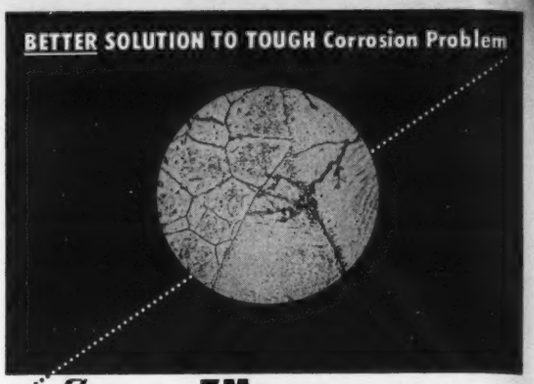
A safety pressure release is provided, which prevents cover blow-off while bomb is being dismantled after heating. A hook-eye is fastened to bomb cover, facilitating handling of bomb. O-ring gasket is used, assuring long life and leak-proof service.

(Copper Strip Corrosion Test Bomb is a product of Precision Scientific Company, Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. . . . or for more information reader may simply check CP 6821 on the convenient Reader Service slip which is located opposite last page.)

Shows flanged valves for corrosives

Line of pinch-type, flanged valves for handling corrosive materials or abrasive slurries, wet or dry, is announced in eight-page bulletin. Valves have a flanged rubber body and self-supported, air-operated pinching mechanism. Units are available in sizes from ¼" through 14" for a maximum of 100 psi line pressure and 180°F operating temperature.

Catalog 1154 is issued by Dept. 6, R.K.L. Valve & Mfg. Co., Dept. CP, 1623 Elaine St., Philadelphia 19, Pa. When inquiring specify CP 6822 on handy form which is located opposite last page.

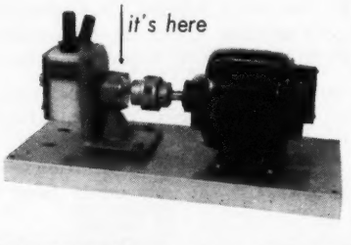


Carpenter **7Mo Stainless Tubing & Pipe**

This photomicrograph may help you solve *stress corrosion cracking* problems. It shows Carpenter 7Mo Stainless Pipe (left) welded to a Type 316 fitting. Note how corrosion-inviting cracks in fitting (right) stop at interface of pipe. The 7Mo pipe had outlasted *three* such fittings before the picture was made because of its stout resistance to stress corrosion cracking, even in the presence of chlorides or other caustic and sulphite solutions. It also offers excellent resistance to general corrosion and pitting, and to oxidation up to 1900°F. Food and chemical processing plants, pulp mills, oil refineries and other industries have found that Carpenter 7Mo Tubing and Pipe are *cost-saving* "problem-solvers". They may belong in your plant, too. Write for Technical Bulletin containing comprehensive data on Carpenter 7Mo.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, New Jersey

When inquiring check CP 6823 opposite last page



VANTON'S External Bearing

X-B PUMP

Without stuffing box, gaskets or valves!

The Vanton corrosion resistant "flex-i-liner" self priming rotary type plastic pump is available in a new design that permanently protects all bearings from fumes or chemical attack.

Low maintenance is assured since shaft bearings are external and rotor assembly is stainless steel. The only wearing part is the quickly replaceable low cost flexible liner.

Capacities range from fractional to 5 gpm with 0-50 psi discharge pressures . . . vacuum to 26" Hg. A wide selection of plastic and rubber body blocks and "flex-i-liners" makes the XB ideal for handling corrosive liquids, gases, viscous fluids or abrasive slurries.

VANTON
PUMP & EQUIPMENT CORP.
Division of Cooper Alloy Corporation • HILLSIDE, N. J.

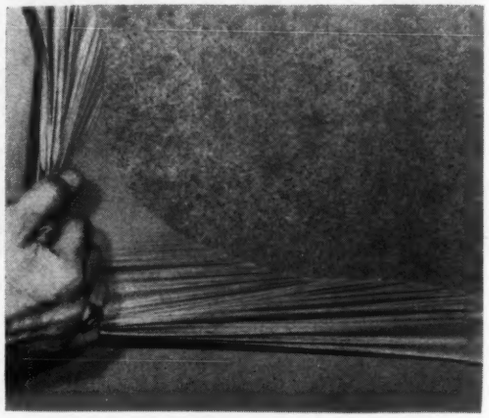
When inquiring check CP 6824 opposite last page

Protection of metal surfaces during interim periods offered by coating . . .

strippable material is applied by brush or spray

Uses: On all kinds of metals during both inside and short-term outside storage; on polished surfaces to prevent marring and scratching; for coating idle tools, dies, etc; as a removable film on inner surfaces of spray booths; and as a web coating to completely enclose bulky objects.

Features: Coating requires no surface preparation and can be stripped off easily when desired without leaving a greasy residue. Application of coating is by either brush or spray.



Coating can be stripped off easily when desired without leaving a greasy residue

Description: Strippable coating is aluminum pigmented to help provide maximum surface toughness and assist in forestalling moisture transmission. Drying time of coating depends upon thickness of coat. However, a film 3 mils thick, sufficient to provide adequate strength for stripping, will dry to handle in 5 to 10 min under average temperature and humidity conditions.

(Aluminum-pigmented strippable coating, PV-845, is a product of Specialty Coatings, Inc., Div. of Thompson and Co., Dept. CP, 1085 Allegheny Avenue, Oakmont, Pa. Check CP 6825 opposite last page.)

Describes alloy fabrication, plastic-lined tanks

Picture-story of fabrication of sheet and plate steel and alloys is presented in 12-page bulletin.

"Fabricators, Sheet and Plate Steel" is issued by A. M. Harris, Inc., Div. of The Bishopric Products Co., Dept. CP, 4413 Este Ave., Cincinnati 32, Ohio. Specify CP 6826 opposite last page.

IT'S NEW! "316" Stainless Steel Meter with Quantity Control Valve

FOR CORROSIVE LIQUIDS

Controls Cost—Controls Quality

Here's a new money-saving tool for you who blend, batch or otherwise process alcohols, vegetable oils, deionized water and corrosive liquids. It's the popular all-stainless steel Rockwell Rotocycle meter fitted with a predetermining register and an automatic shut-off valve. You just set the quantity you wish the meter to dispense and when this quantity has been measured, the flow is stopped. The stainless steel control valve is of the multi-stage type to avoid hydraulic shock. Use the handy coupon for full details.

ALL TYPES OF INDUSTRIAL METERS Rockwell makes all sizes and types of meters for use by industry. With them you can get positive metered accounting for a multitude of liquids. You can guard the quality of your formulations, keep tab on liquid inventories, have accurate records for cost control and tax analysis purposes. Now is the time to *meter and save.*

ROCKWELL
INDUSTRIAL
METERS

YOU CAN RELY ON ROCKWELL

CLIP COUPON—MAIL TODAY

Rockwell Manufacturing Company **Dept. 106-E**
Pittsburgh 8, Pennsylvania

Gentlemen:

I am interested in measuring _____ (Name of Liquid)

Pipe Size _____"

Working Pressure _____psi Temperature _____°F max.

Max. Flow Rate _____gpm Min. Flow Rate _____gpm.

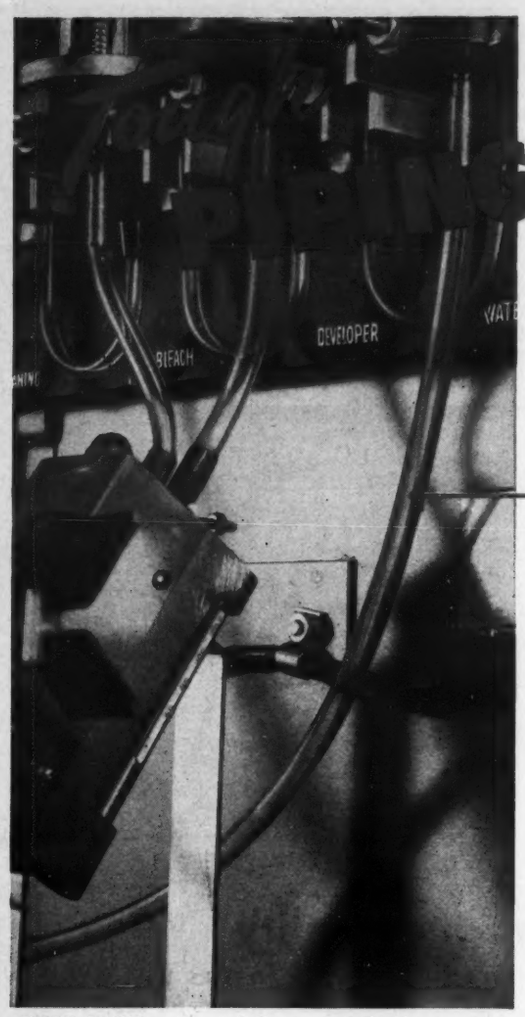
YOUR NAME _____

COMPANY _____

STREET _____

CITY _____ ZONE ____ STATE _____

When inquiring check CP 6827 opposite last page



TYGON TUBING — as used in an automatic picture taking machine. Here the clarity, flexibility, and resistance of TYGON to photographic chemicals has greatly increased service life, simplified operation, and minimized maintenance as compared to that obtained with rubber tubing.

PROBLEMS

EASILY SOLVED WITH

TYGON TUBING

Every day, tough piping problems — big and small — are being solved with versatile, plastic TYGON TUBING. Designers and engineers, throughout industry, are finding TYGON the quick, easy, positive answer to tricky transmission jobs involving liquids, gases, or semi-solids.

TYGON Tubing not only resists acids, alkalies, oils, greases, certain solvents, and water — but is glass-clear and fully flexible. TYGON also is strong, smooth-surfaced, abrasion-resistant, light in weight, and non-oxidizing. Certain formulations are completely non-toxic.

TYGON's excellent chemical resistance permits its use with virtually any corrosive. Its clarity permits full solution visibility and control. Its flexibility permits the most intricate use without kinking. Its smooth surfaces give maximum flow, easy cleaning, and free draining. Its non-toxicity assures complete safety in food, beverage or medical applications.

TYGON Tubing is made in continuous lengths and a number of stock sizes ranging from ⅛" ID to 2" ID. There are six standard formulations available in clear or glossy black which exhibit a range of physical, electrical, and chemical properties. Braided jacket reinforcement of stainless steel, Saran, or cotton is available and suggested where high constant pressures are encountered.

Write, today, for more information and technical assistance on the use of TYGON Tubing. Ask for Bulletin T-87. Ask also about the other forms of versatile TYGON that can help you combat corrosion.

TYGON PAINT

quickly applied, fast drying protection against corrosive fumes and spillage.

TYGON TANK LINING

long lasting, heavy duty sheet TYGON to withstand virtually all chemicals.

MOLDED TYGON

accurate, durable parts and fittings of outstanding chemical resistance for all types of equipment.

U. S. STONEWARE
AKRON 9, OHIO

TYGON Flexible Plastic TUBING

403-C

PLASTICS AND SYNTHETICS DIVISION

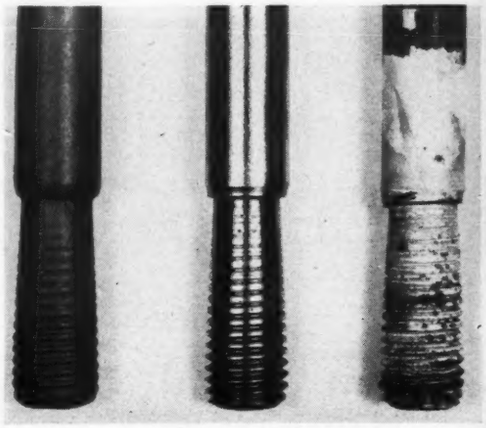
When inquiring check CP 6828 opposite last page

Protective film won't flow away from sharp edges . . .

high solids content of vinyl coating enables 10-mil build in one double-pass spray coat

Vinyl mastic protective coating can be applied at a thickness of 10 mils in one double-pass spray coat. Heavy film thickness is produced without sacrificing chemical and moisture resistance of vinyls.

Despite unusually high-solids content, coating is applied with conventional industrial spray equipment. Highly impermeable protective film does not flow away from edges and sharp corners, thus pro-



Bolt on left has one coat of primer and one coat of No. 87 vinyl mastic. Center bolt is uncoated to show surface detail. Bolt on right has three coats of conventional vinyl coating. Both coated bolts were exposed to severe salt spray tests for same period of time. Note the corrosion is worst on bolt at right where thread edges are sharpest and hardest to coat. Vinyl mastic coating at left is unaffected at any point

viding extra protection for these areas which are particularly susceptible to corrosive attack. Coating has a non-volatile content in excess of 55%. It requires no catalysts or baking. Coating dries hard to touch overnight, but because of thickness, requires several days to attain maximum toughness and chemical resistance.

Coating must be applied over special primer, never directly to bare metal.

Because of one-coat protection offered by coating, savings up to 50% of labor cost are said to be obtained in application.

(Vinyl mastic protective coating, No. 87, is a product of Amercoat Corporation, Dept. CP, 4809 Firestone Blvd., South Gate, Calif. . . . or for more information reader may simply check CP 6829 on the convenient Reader Service slip which is located opposite last page.)

PUMP

Liquids • Gases • Slurries

WITHOUT CORROSION OR CONTAMINATION

Wavelike Motion of

Steel Fingers Forces Material Through Tubing

Prices range from.....$55 to $500 depending on size of pump and accessory equipment required.

Write for Catalog

SIGMAMOTOR Inc.

18 North Main Street • Middleport, N. Y.

When inquiring check CP 6830 opposite last page

EVERY TYPE to fit every problem

INCO-CAST Fittings

CORROSION-RESISTING

Monel,® Nickel and Inconel®

- Resist most corrosives
- Withstand high and sub-zero temperatures
- Strong, tough, sound
- Protect product purity
- Pressure-tested
- Economical in cost
- Controlled alloy composition
- All standard types and sizes in threaded and welding fittings
- Fast service on rated orders to all points from conveniently located distributor stocks
- Special shapes and sizes made to order

WRITE for handy price list catalog. Contains full information, and will be sent you promptly. No obligation.

INCO The International Nickel Company, Inc. 67 Wall Street, New York 5, N. Y.

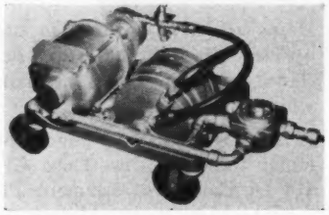
When inquiring check CP 6831 opposite last page

Heated coatings applied outdoors with mobile spray heater . . .

hot-spray improves coating, is faster

Uses: Heating of vinyls, enamel, cutback asphaltums, and similar protective coating materials which may be hot-sprayed to produce a smoother, denser film.

Features: Unit brings advantages of heated application to outdoor maintenance work since it can be moved for use where needed. Hot-spray application is faster, and one coat replaces two or more coats of cold application.



Heater supplies spray gun with 15 gph of hot coating material

Description: Mobile hot-spray heater operates with standard pressure tank or pump and may be elevated on a scaffold or operated at ground level. Heavy-duty, 2000-watt, UL-approved heater and explosion-proof motor will maintain hot material at the spray gun at a capacity of 15 gph for distances to 50 ft from heater.

(Hot-spray heater, Model 600C-PE is a product of Spee-Flo Corporation, Dept. CP, 720 Polk Ave., Houston, Texas. Check CP 6832 opposite last page).

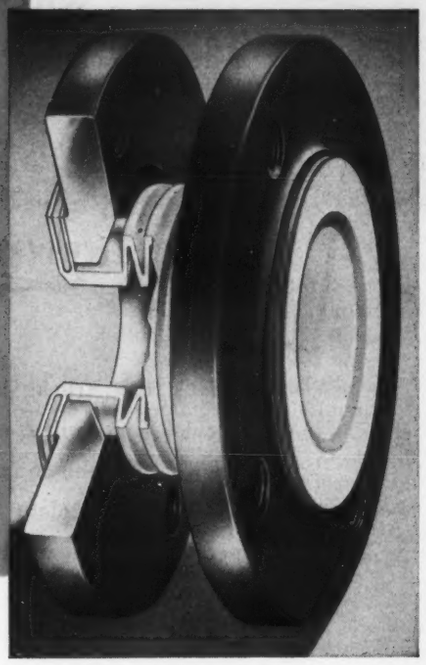
Guide to tubing

Pertinent information needed for selection and application of 46 principal analyses of tubing is condensed in catalog.

Bul 40 is issued by Superior Tube Co., Dept. CP, 1512 Germantown Pike, Norristown, Pa. Specify CP 6833 opposite last page.

JOHN CRANE *announces*

a complete line of TEFLON* BELLOWS



with

companion flanges

"John Crane" chemically inert, corrosion, heat and fatigue resistant bellows (made of Teflon) are now available furnished with companion flanges. Flanges conform to American Standard bolt hole circles and numbers.

Strength, service life and flexibility have been increased through development of a new convolution form. Bellows are formed at full free length, thus reducing residual and working strain to a minimum. Expansion and contraction in either direction takes place with equal freedom of motion. Operating temperature ranges from —300°F. to + 500°F. . . . pressures to 75 psi.

Bellows flanges are French-type gasket construction to provide highest possible sealing efficiency at low flange pressure. Resilient insert material is asbestos or synthetic rubber.

Investigate "John Crane" Teflon bellows with companion flanges for your "hard-to-handle" applications . . . vibration dampeners . . . expansion joints . . . flexible connectors. Supplied to fit any pipe size from ½" through 12". Other designs for metering pumps, pressure accumulators, batching scales, hydraulic systems and similar applications.

Contact "John Crane" for full information, including booklet, *The Best in Teflon*. Crane Packing Co., 1821 Cuyler Avenue, Chicago 13, Illinois. *In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N., Hamilton, Ont.*

*DuPont trademark

JOHN CRANE CRANE PACKING COMPANY 38 YEARS INDUSTRIAL PROGRESS

When inquiring check CP 6834 opposite last page

Have trucks, will travel. Men, materials and equipment ready to come to your plant, anywhere in the country. Will solve your corrosion problems on large chemical processing equipment. Call Detroit—KEnwood 2-3000.

That's right, trucks carrying ARco Field Service Units will come to your plant anywhere in the country. Each unit is a complete plant on wheels staffed with personnel whose skill and experience will contribute heavily in rendering your chemical processing equipment corrosion-proof.

An outstanding record of successes in the elimination of corrosion . . . countless testimonials from industrial management on savings in time and material . . . this is proof of the benefits that ARco Field Service offers you . . . with advanced procedures and controlled rubber compounds.

No matter how large the tank or system, an ARco Field Service Unit insures you against corrosion. So, don't wait, ask us to take a trip. Write, wire, or call for complete details. Automotive Rubber Company, Inc., 12568 Beech Road, Detroit 39, Michigan.

detroit • kalamazoo • houston

ARco

When inquiring check CP 6835 opposite last page

For fastening cables, wires, cords — plastic straps

Uses: Fastening and supporting open wires, cables, and cords.

Features: Straps are made of polyethylene which is strong, tough and pliable, yet light in weight. They are unaffected by heat, cold, moisture, salt air, and gaseous fumes.

Description: Non-corrosive plastic straps are made in black and ivory colors. Edges of the straps are thick, pliable and round for protection against short circuits, especially under conditions of vibration, strain, wind, and weather.

Straps are fast and easy to use because mounting holes are designed to hold screws or nails while driving.

(Plastic straps are products of Holub Industries, Inc., Dept. CP, 414 De Kalb Ave., Sycamore, Ill. . . . or for more information check CP 6836 on handy form opposite last page.)

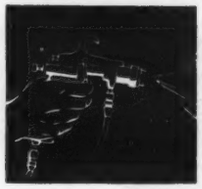
Stainless alloy resists stress corrosion cracking

Stainless tubing and pipe of a special intermediate alloy have been developed for applications requiring strong resistance to stress corrosion cracking as well as general corrosion.

Steel differs structurally from other stainless steels in that it cannot be classified strictly as martensitic, ferritic or austenitic. Its resistance to general corrosion and pitting is similar to that of Type 316, but in resisting stress corrosion cracking it is said to be superior to 316.

(7Mo stainless steel alloy is a product of The Carpenter Steel Company, Alloy Tube Division, Dept. CP, 110 Springfield Rd., Union, N. J. . . . or for more information check CP 6837 on handy form opposite last page.)

New corrosion-control "tool" . . . sprayable plastisol



Any metal surface that can be sprayed and uniformly baked can now be protected against severe, corrosive conditions with **Unichrome Coating 5300**—the first practical spraying type vinyl plastisol.

Unichrome Coating 5300 offers continuous, seam-free and pore-free protection against acids, alkalies, water, salt solutions, and many other corrosives. It levels surface irregularities and provides substantially greater film thickness, features which are particularly important in coating surfaces that are not smooth. The coating is resilient, resists abrasion, chipping, cracking. *Dry film thicknesses up to 20 mils can be obtained in one coat.* Send for Bulletin VP-1.

UNICHROME Trade Mark **COATINGS FOR METALS**

Products of UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N. Y. • Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 6838 opposite last page

IOLYTE Laminated Fiberglas ACID FUME DUCTS

CUSTOM BUILT FROM DRAWINGS OR PRINTS AT NO EXTRA COST

ANY DIMENSIONS
ANY CURVES
ANY LENGTHS

IOLYTE has greater resistance to chemical attack than stainless, Monel, or aluminum. 1/5 the weight of steel, it is superior in tension, flexural, and compression strength. Unlike thermoplastics **IOLYTE** will not heat-distort below 350 deg.

Stacks, tanks, crocks, dampers, elbows, etc. also fabricated to order. Standard size crocks available in stock.

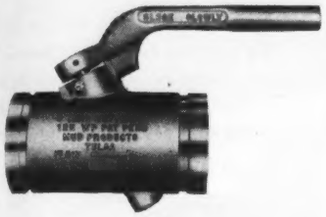
Send drawings or prints for quotes and ask for literature giving chemical resistances.

SCHORI PROCESS DIVISION
FERRO CO CORPORATION
8-10 43RD ROAD, LONG ISLAND CITY 1, N. Y.
FACTORY: 59-31 54TH STREET, MASPETH, L. I.

When inquiring check CP 6839 opposite last page

Butterfly valve line made in several C-R materials . . .

grooved ends simplify coupling



Produced from semi-steel for general purpose application and ceramic lined semi-steel for handling corrosive fluids, O-ring butterfly valves are now available with grooved ends in 2, 3, and 4" sizes for use with grooved-type couplings. Valve can also be furnished in aluminum bronze, stainless steel, or aluminum.

(Mudco O-ring butterfly valves are manufactured by Mud Products, Inc., Dept. CP, Philtower Bldg., Tulsa 3, Okla. . . . or for more information check CP 6840 opposite last page.)

Phosphate coatings use described

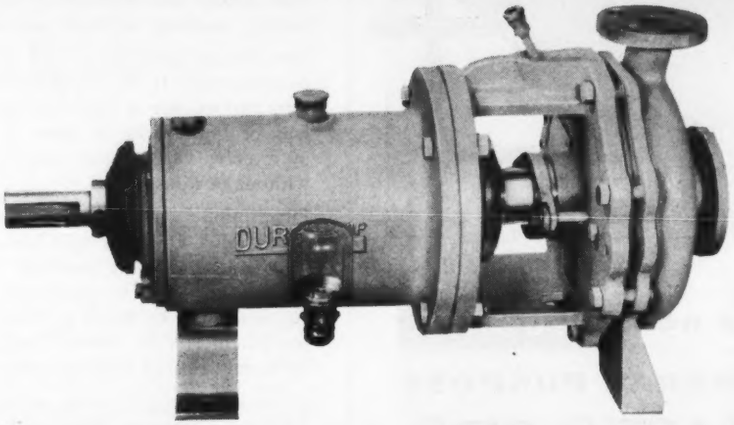
With an introduction on the use of phosphate coatings for the protection of metal surfaces, eight-page booklet describes the seven conversion coatings most commonly used in industry and explains mechanism of the phosphate coating formation.

"Phosphate Coating Comes of Age" is issued by Metalwash Machinery Corp, Dept. CP, 938 Fourth Ave., Elizabeth 4, New Jersey. Specify CP 6841 opposite last page.

For more information on product at right, specify CP 6842 . . . see information request blank opposite last page.

all new SERIES H DURCOPUMPS

NEW for heavy duty corrosion service



Series H DURCOPUMPS are all new, heavy duty chemical pumps. With a large, rugged shaft, heavy bearings, open or closed impeller and new features of adaptability, these pumps provide long, dependable pumping life with easy, low-cost maintenance. Designed for high heads and low capacities as well as for routine conditions, Series H Durcopumps can provide the answer to your tough pumping problems.

NEW for easy modification and minimum spare parts inventory

only 3 BEARING HOUSINGS for the complete range of pump sizes

The entire range of new Series H Durcopumps is accommodated by just three bearing housings and suitable adaptors. This unique feature coupled with the availability of eleven standard Durco alloys make the Series H DURCOPUMPS the most versatile chemical pumps ever developed.

Let us help you solve your difficult pumping problems.

Write for Durco Bulletin P/8, or call the Durco engineer located near you.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, Inc. / Dayton, Ohio

BRANCH OFFICES in Atlanta, Boston, Buffalo, Chicago, Cleveland, Detroit, Houston, Knoxville, Los Angeles, New York, Philadelphia, and Pittsburgh.

the new **TOUGHER**

GENERAL PURPOSE

PLASTIC PIPE

ACE-ITE is a new moderately priced rigid plastic pipe with exceptional impact strength and toughness . . . handles most corrosive fluids in your plant at moderate temperatures and pressures.

For piping most inorganic acids, salts, alkalis and many organic chemicals, it's the equal of plastics that cost far more. ACE-ITE maintains good strength, rigidity and chemical resistance from minus 40 deg. F. to 170 deg. F. Light in weight, it is odorless, tasteless, non-contaminating. Saves cost of painting, immune to electrolytic corrosion and bacteria. Available in pipe sizes from ½" to 6", standard and extra-heavy, with wide variety of fittings.

ACE-ITE is only one of eight types of rubber and plastic pipe now offered by American Hard Rubber Company. Write today for free technical Bulletin 80.

ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY

93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 6843 opposite last page

Speed of painting doubled with use of exterior masonry coating . . .

corrosive atmospheres and liquids won't harm this polyvinyl acetate emulsion

Uses: As a paint for exterior stucco, concrete block, and asbestos shingle.

Features: Paint shows excellent resistance to acid, alkali, and moisture. It is also resistant to fading, staining, peeling, and mildew.

Free-flowing material is said to double speed of painting since it flows rapidly and works quickly into surface for a uniform appearance, free of laps or brushmarks. It dries to the touch within 30 minutes. Missed spots may be touched up later without obvious effects.

Description: Exterior masonry paint, called Spred Glide-On, is a free-flowing polyvinyl acetate emulsion. It is available in twelve colors, white, and eighteen additional intermix colors. Application is by brush or roller, and application equipment can be cleaned completely in seconds by merely rinsing in soapy water and under a tap.

(Exterior masonry paint is a product of The Glidden Company, Dept. CP, 10999 Madison Ave., Cleveland 14, Ohio . . . or check CP 6844 on handy form opposite last page.)

Resists undercutting by corrosion when cover coat damaged . . .

primer locks to surface and bond increases with age

Uses: As a liquid primer for new or corroded steel surfaces.

Features: Primer offers resistance to undercutting by corrosion when cover coats are mechanically damaged. On either sandblasted new steel or wirebrushed rusted steel, it forms a tight adherent bond to surface and provides excellent adhesion for following top coats of company's NeoCoat (liquid neoprene) or Thickcoat, a chlorinated aliphatic hydrocarbon. It is equally effective in acidic and organic atmospheres.

Description: Applicable to all ferrous metal surfaces, tile red, corrosion-resistant liquid primer contains 28% solids content by weight and covers 200 sq ft per gal per one mil coat. Since bond strength of primer increases with age, immediate application of top coat is unnecessary.

(LockPrime corrosion-resistant liquid primer is a product of Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. . . . or check CP 6845 on handy form which is located opposite last page.)

Corrosion

THE THIEF OF INDUSTRY

Exacts a toll of 8 Billion Dollars a Year

. . . AND INDUSTRY PAYS OFF, despite the fact that Science and Research have developed hundreds of test proven protective coatings to meet any corrosion problem.

There are but three steps to adequate CORROSION CONTROL

1-ANALYSIS

The condition must be analyzed by competent and experienced Corrosion Engineers highly skilled in Corrosion Survey and Research. A METAL-CLADDING Service.

2-SPECIFICATION

The result of such a survey will be the selection of a coating that will give Positive Protection against the particular corrosive action encountered. A METAL-CLADDING Service.

3-APPLICATION

The EFFECT then depends on *proper application and surface treatment.* Only CUSTOM APPLICATORS skilled in highly specialized techniques and equipment can assure the end result intended. A METAL-CLADDING Service.

Metal-Cladding Corrosion Control Service can reduce your maintenance costs, extend equipment life or protect product from contamination.

Write or phone us . . . LUDLOW 6205

METAL-CLADDING, INC.

NORTH TONAWANDA, N. Y.

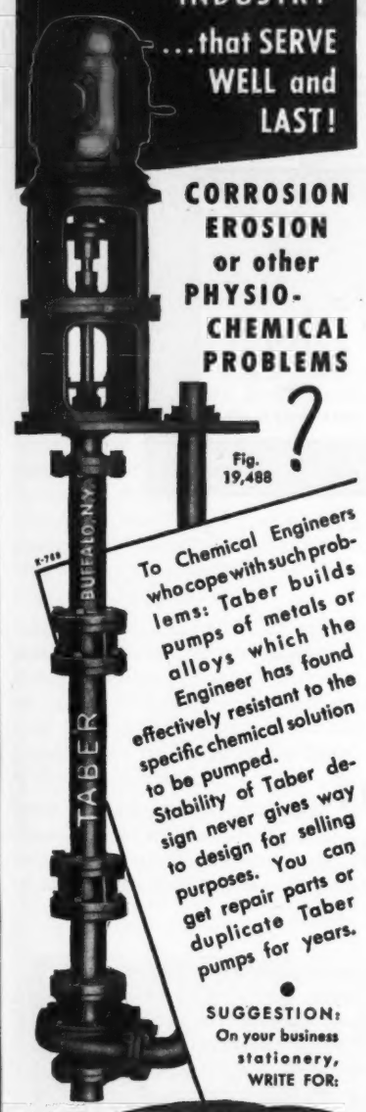
Corrosion Engineering

ANALYSIS SPECIFICATION APPLICATION

When inquiring check CP 6846 opposite last page

PUMPS for the PROCESSING INDUSTRY ...that SERVE WELL and LAST!

CORROSION EROSION or other PHYSIO-CHEMICAL PROBLEMS ?



To Chemical Engineers who cope with such problems: Taber builds pumps of metals or alloys which the Engineer has found effectively resistant to the specific chemical solution to be pumped. Stability of Taber design never gives way to design for selling purposes. You can get repair parts or duplicate Taber pumps for years.

SUGGESTION: On your business stationery, WRITE FOR:

BULLETIN V-837

TABER PUMP CO. Est. 1859
320 ELM ST., BUFFALO 3, N.Y.

When inquiring check CP 6847 opposite last page

How sodium nitrite controls rust and corrosion

Detailed information on the use of sodium nitrite as an inexpensive and efficient rust and corrosion inhibitor is presented in 20-page booklet. Use of product alone to protect metals surfaces, or combinations of sodium nitrite with such materials as caustic soda or phosphates is covered.

"Sodium Nitrite for Rust and Corrosion Prevention" is available from Solvay Process Div., Allied Chemical & Dye Corp., Dept. CP, 61 Broadway, New York 6, N.Y. Specify CP 6848 on handy form opposite last page.

Bonds to iron or steel even through rust . . .

zinc-resin coating gives galvanized protection

Zinc-resin vehicle coating mechanically and electrochemically cold-galvanizes iron and steel to protect against rust damage. Applied by brush, coating, called End-O-Rust, bonds to any iron or steel surface, even a rusty one, that is dry, free of grease and loose scale, and not painted with a tar or bituminous paint.

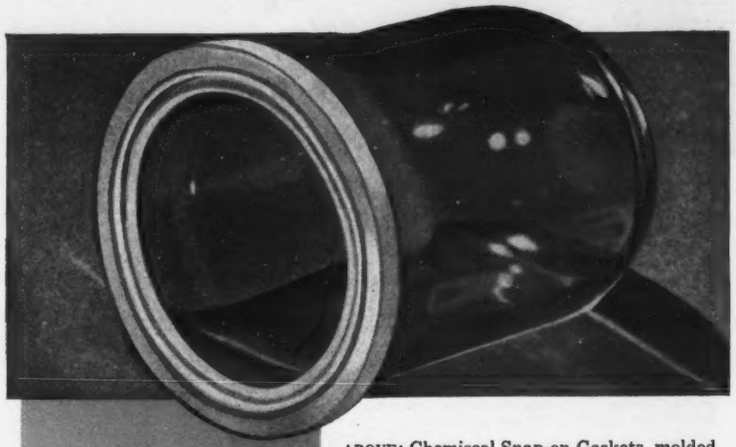
(Rust-proof coating is a product of Industrial Craftsmen, Inc., Dept. CP, 145 High Street, Boston 10, Mass. Check CP 6849 opposite last page.)

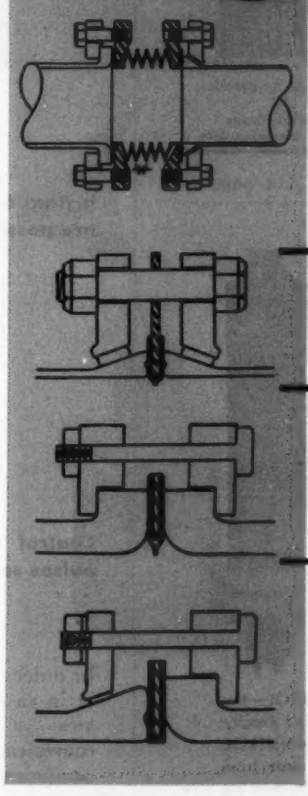
This 3100-gallon tank for processing a special, high quality, water-white, food-grade phosphoric acid is one of the first to be lined with white rubber compound. Lining was developed to resist discoloration of the acid which is used in the preparation of many food products. The ¼" sheets of rubber are rolled firmly into place over a rubber adhesive which bonds rubber to metal.

(White rubber lining is a development of Industrial Products Div., The B. F. Goodrich Co., Dept. CP, 448 S. Main St., Akron, Ohio . . . or check CP 6850 opposite last page.)

Chemiseal (MADE OF TEFLON DuPont Trademark) Gaskets

and Accessories for Glass Piping





ABOVE: Chemiseal Snap-on Gaskets, molded of TEFLON to match contour of conical end glass pipe, assure perfect automatic centering of joints and free flow of materials. For all standard pipe sizes from ¼ in. to 6 in.

AT LEFT: Chemiseal Expansion Joints and Flexible Couplings absorb shock and vibration, thermal expansion and contraction. Correct misalignment. Connect unlike piping ends and nozzles.

Chemiseal TEFLON-Jacketed Gaskets, standard for Corning conical flanges. Seal at low bolt loads. Sizes from 1 in. to 6 in.

Chemiseal TEFLON-Jacketed Gaskets. Compressed asbestos sandwiched between woven asbestos inclosed in a TEFLON envelope. Ideal for glass-lined steel connections. Seal at low bolt loads.

Chemiseal Adaptors provide a safe, tight seal between unlike piping ends and nozzles. A steel bearing ring provides rigidity. Resilient core assures positive seal. TEFLON Jacket protects and contains easy-to-handle single unit.

WRITE FOR CATALOG NO. TG-953.

UNITED STATES GASKET COMPANY • CAMDEN 1, NEW JERSEY

USG

FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS

Representatives in principal cities throughout the world

When inquiring check CP 6851 opposite last page

MARSH *Mastergauge*

Always the best of the better gauges, Mastergauge has been given *plus* features that further lengthen its lead.

A still better tube construction: Socket, tube and end piece are now all fused into *one* leak-tight unit by the new Marsh "Conoweld" process.

A still better case: New copper clad wrought steel "Marshalloy" case has the corrosion resistance of pure copper; weighs one third as much as cast iron, and is *four times* as strong.

An even finer movement: Further refinements are added to the rugged, corrosion resistant, virtually frictionless stainless steel and monel Mastergauge movement. A typical refinement is the "coined" (extruded) sector gear which contributes extra strength and precision.

Where only the best is good enough—in the most critical industrial refinery and oil country services —"Mastergauge" is your instrument.

WRITE FOR NEW CATALOG

MARSH INSTRUMENT CO. Sales affiliate of Jas. P. Marsh Corporation
Dept. Z, Skokie, Ill.
Houston Branch Plant: 1121 Rothwell St., Sect. 15, Houston, Texas
Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103rd St., Edmonton, Alta.

When inquiring check CP 6852 opposite last page

now-
MEASURE, CONTROL LIQUID DENSITY
continuously and automatically with the

PRINCO
Since 1910

Densitrol

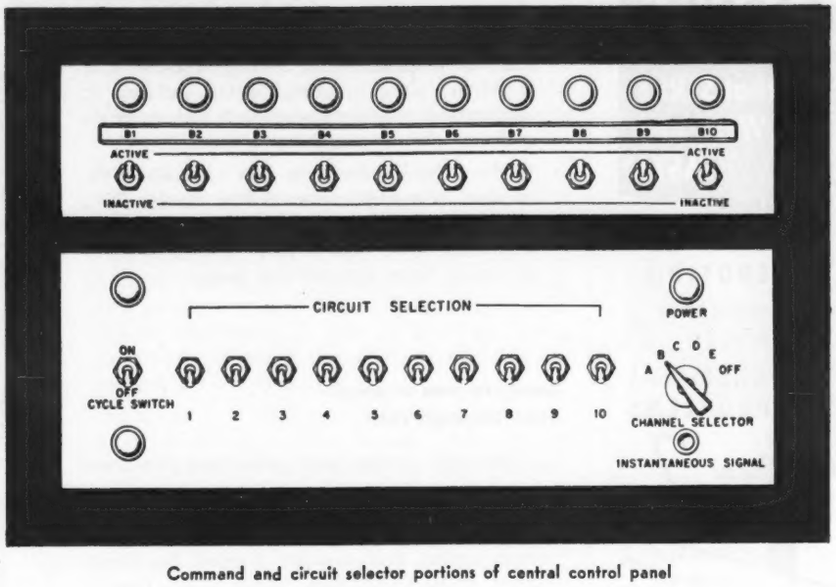
Process industries will welcome the new DENSITROL—the precision instrument that gives a continuous reading of density in flowing liquids such as sugar syrups, brine, acids. DENSITROL electrical indicators or recorders can be located remote from the sampling chamber itself. If desired, DENSITROL can be linked with control mechanisms for automatic regulation. For information on temperature and pressure ranges, calibrations, and other specifics, request Bulletin W-3.

PRECISION
THERMOMETER & INSTRUMENT CO.
1434 Brandywine Street, Philadelphia 30, Pa.

Makers of precision-built thermometers, barometers, hydrometers, gauges, indicators, mercury in glass thermo-regulators.

When inquiring check CP 6853 opposite last page

instrumentation & control



Command and circuit selector portions of central control panel

Instant control and convenient programming are possible in this system which

controls remote equipment without wires

Control effected by frequency-coded pulses sent over existing power wiring

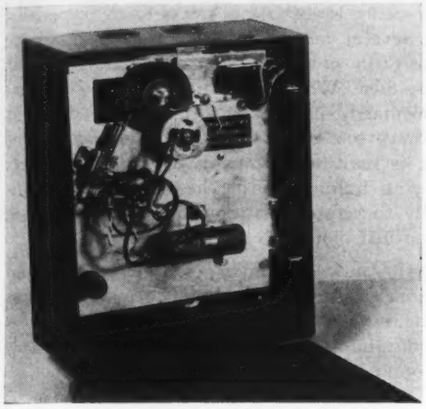
In order to install a control system in a plant — or in an area ten or one hundred square miles in area — a central operations panel is located wherever convenient and receiving relays are located at equipment to be controlled. No wires or tubes connect control station and receivers, except those of power wiring for the plant.

Central operations panel is source of system's directions or commands. It is equipped with both a master clock and programming equipment and switches for putting commands into system manually. Panel also contains circuit selection and inactivation switches, pilot lights and channel selector.

Command goes out when program or manual switching calls for it. In either case an electronic oscillator sends out coded pulses at frequencies above the audio range. (Typical frequency: 35,000 cps.) Frequencies are chosen so that they pass through power transformers readily. In practical applications these pulses have been transmitted over ordinary power lines for 17 miles; with boosters the usable range is virtually limitless.

Ten ON and ten OFF codes can be transmitted on the same frequency and each decoding relay is capable of picking out its own code from among these ten. Variety of relays are available to handle several classes of duty requirements. Straight on-off operation of solenoids, for example, has a different requirement from heavy motor starting (done through starting boxes and relays) or long period switching where a latching relay is used.

Central operation panel pilot lights show on or



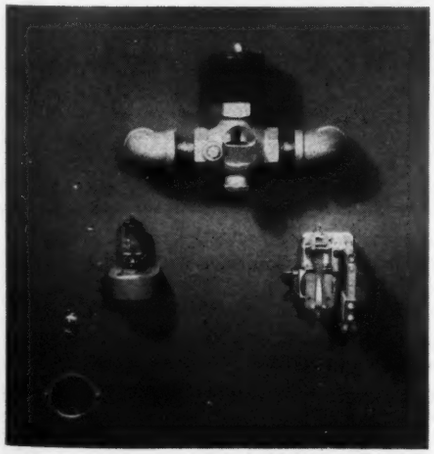
Typical control relay

off status of each circuit. But inactivating switches provide a ready means for making any programmed circuit inoperative for as long as needed. With manual control, of course, controlled stations can be switched on or off at will. Where programmed control is needed but programs have to be changed occasionally, a metal "comb" is altered to produce desired timing. By breaking teeth out of the comb proper intervals are attained.

Enlarging scope of controlled operation is always possible. Components are mostly of the plug-in variety (a factor in ease of servicing, too). Central panel is furnished with blank spaces for additional control equipment to be added. Forty controlled circuits (independent functions) is maximum in standard equipment.

System is designed to cope with power failures. Power reserve at central operations panel keeps master clock running for two hours. When power resumes, controlled stations are switched to their

(*Continued on next page*)



One electronic tube and relay control solenoid valve

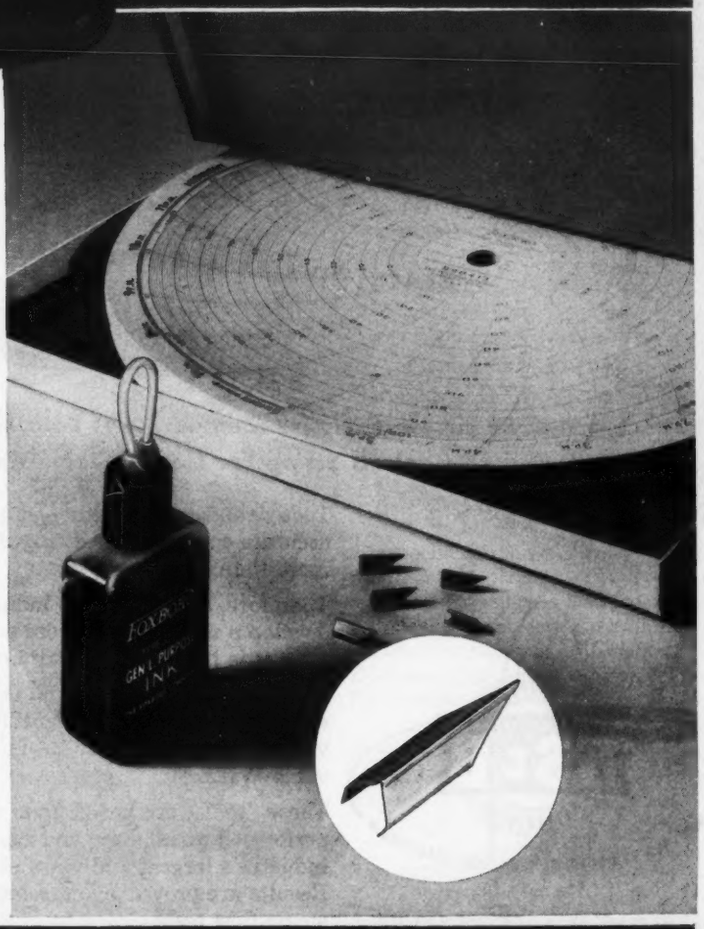
Better Records

BETTER CHARTS
Humitex Charts printed from high-precision plates, under controlled humidity conditions, on special, high-stability paper. Easy-to-read gray printing against chart's smooth, white background brings out full brilliance of new Foxboro Ink.

BETTER PENS
Non-corroding, stainless-steel pens with positive capillary feed. Controlled special-process points (standard and fine line) assure sharper, cleaner records.

BETTER INK
Five rich, brilliant colors . . . won't clog or "feather" . . . sediment-free . . . flows smoothly under all atmospheric conditions. Specially formulated for new Foxboro Pens and Charts.

NEW INK DISPENSER
Exclusive-design, easy-to-handle polyethylene "squeeze" dispenser (pat. pend.) gives pin-point control of drop size, ends messy pen-filling. Won't leak or break.

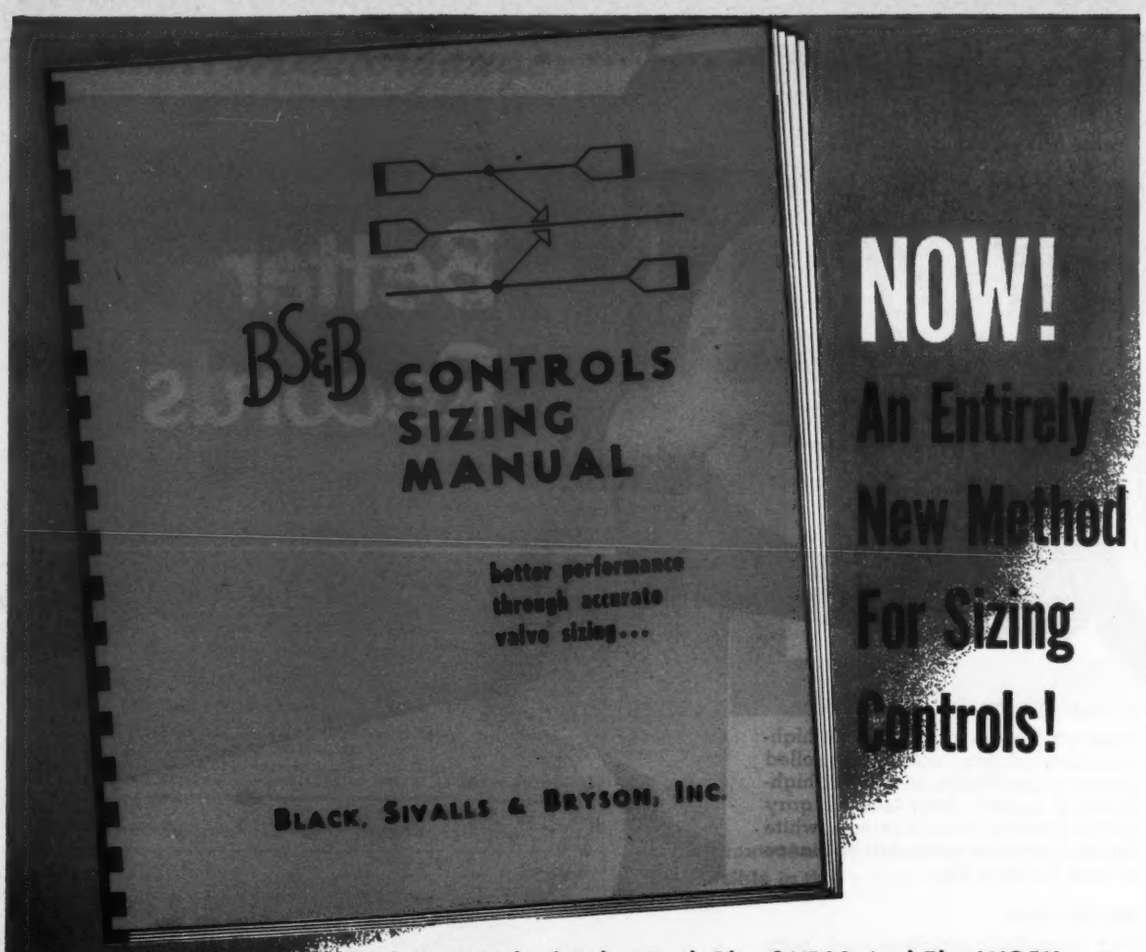


THE FOXBORO COMPANY
815 NEPONSET AVE., FOXBORO, MASS., U.S.A.

FOXBORO
REG. U. S. PAT. OFF.
FOR BETTER RECORDS

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

When inquiring check CP 6854 opposite last page



NOW!
An Entirely New Method For Sizing Controls!

BS&B's New, Exclusive Method Takes Both The GUESS And The WORK Out Of Controls Sizing For Liquid, Steam And Gas Applications!

Today's modern and complex processing systems require accurate control valve sizing. No one has recognized this fact more than BS&B.

Therefore, as a service to industry, BS&B set out to develop a new, simple, more accurate method of sizing controls. Here it is in the new BS&B Controls Sizing Manual.

This new, exclusive method uses two new "tools" to make sizing more accurate—the SIZE-O-GRAPH to determine what the valve MUST do and Cv RATINGS to determine what the valve WILL do.

These "tools" are based upon thousands of hydraulic flow tests performed on all sizes and types of BS&B Controls in the industry's largest and most modern flow testing laboratory. Results are proven by correlation with *actual* gas and steam flow tests.

If you'd like a copy of this new manual, write to . . .

OVER 60 YEARS BS&B ANOTHER EXAMPLE OF PRODUCT LEADERSHIP

BLACK, SIVALLS & BRYSON, INC.
Controls Division, Dept. 4-M5
7500 East 12th Street, Kansas City 26, Missouri

When inquiring check CP 6855 opposite last page

(*Continued from preceding page*)

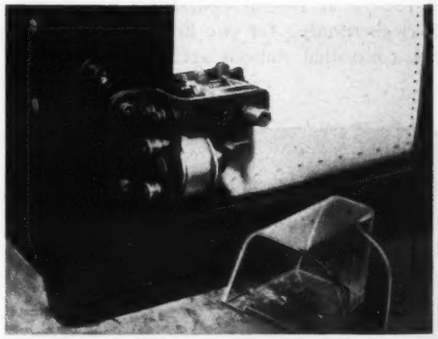
proper status. In the case of heavy loads (especially where several motors might try to start simultaneously on power resumption) a holding coil relay is used. When relay receives "on" command it momentarily makes. Likewise on "off" command it operates momentary break contacts. Because of this it is used with starting devices or contacts employing holding coils. These are started individually, therefore. Relay control does not interfere with normal motor overload protection.

(Central Control System is a development of International Business Machines Corp., Dept. CP, 590 Madison Ave., New York 22, N.Y. . . . or for more information check CP 6856 on handy form opposite last page.)

Samples hot and dirty gases, readies them for analysis

Two-page bulletin outlines continuous gas analysis system designed for steam generator plants, rotary kilns and dryers and open-hearth furnaces. It shows how hot and dirty process gases can be properly prepared for analysis.

Bul 703-A is issued by Arnold O. Beckman, Inc., Dept. CP, 1020 Mission Street, South Pasadena, California. When inquiring specify CP 6857 on handy form opposite last page.



Supplied in kit form, this time and date printer can be attached to any conventional stripchart recorder. Whenever it is pulsed by voltage, it prints time or date on the record. Mounted in place, timer does not interfere with recorder operation. Kit includes timer, rubber platen to fasten behind chart, replacement plastic window and cover, hardware.

(Identichart printer is a development of Royson Engineering, Dept. CP, 102 N. Penn St., Hatboro, Pa. . . . or for more information check CP 6858 on handy form opposite last page.)

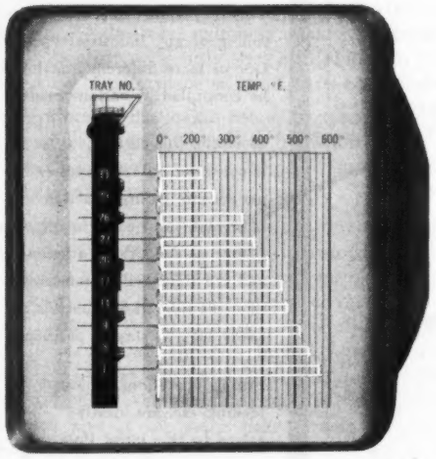
TV tube displays readings at several points

operator sees temperature "profile" for example, at a glance; use with pH, flow, level, pressure, etc.

Uses: Provides instantaneous reading of a large number of monitored points for pH, flow, level, pressure, or other variables which can be measured electrically.

Features: Information of all points monitored is constantly available to operator. No switching or selecting is needed — operator sees *all* points at *all* times.

Description: Scanning system is non-mechanical and will remotely indicate and/or alarm at predetermined levels of the variable. Sensing elements are connected to transmitters and receivers where necessary. Transmission link is a single coaxial



Light trace on TV tube shows temperature at points in distillation tower

cable which can bring in information from at least 32 sensing elements.

All points monitored are scanned 60 times each second. Scanning rate may be varied where special requirements make this necessary.

Plug-in electronic equipment is used at both ends. Receiver output may be used to drive annunciator panel with alarm lamps for point identification. Visual monitoring is facilitated by cathode ray tube showing "pips" proportionally in height or breadth to variable amplitude.

(Scanning system is a development of The Kybernetes Corp., Dept. CP, 1100 Raymond Blvd., Newark 5, N. J. . . . check CP 6859 on handy form which is located opposite last page.)

This

NEW BULLETIN

provides economical solutions to every industrial water treatment problem

ENGINEERS and consultants helped prepare this new Bulletin No. 953 . . . "Controlled Volume Pumps for Water Treating Systems."

It has been termed, "a most important contribution to water treating literature."

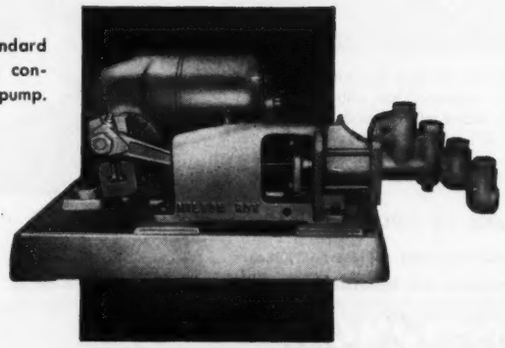
Over fifty illustrations are used in this first-of-its-kind Bulletin, to describe and picture:

- Controlled Volume Pumps and how they work.
- Actual applications in all phases of industrial water treating.
- Basic and advanced system design.

Send for your free copy today . . . on your company letterhead, please!

For specific recommendations on water treatment problems, see your consulting specialist. For reliable, accurate flow control of water treating chemicals, see Milton Roy Company, Manufacturing Engineers, 1300 East Mermaid Lane, Philadelphia 18, Pa.

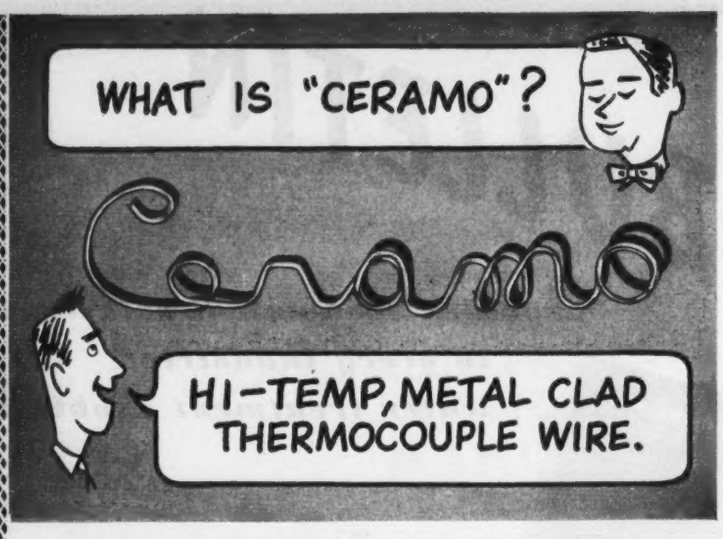
Milton Roy standard motor-driven controlled volume pump.



milton Roy
CHEMICAL FEED SYSTEMS

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.

When inquiring check CP 6860 opposite last page



T-E's "Ceramo" wire consists of thermocouple material conductors, surrounded by magnesium-oxide insulation, with seamless metal tubing overall.

Thermocouples or extensions made of "Ceramo" wires will fit into openings that are too small for most ordinary thermocouples or extensions. Furthermore, they can be formed easily to any configuration without short-circuiting—in fact, "Ceramo" can be bent on a radius as small as its own diameter. The durability of the outer metal tube makes conduits unnecessary. Not even a hammer blow will injure it; in fact, it will withstand pressures up to 40,000 psi. These metallic clad wires have excellent resistance to high temperature, moisture, chemicals, petroleum products, atomic radiation or abrasion.

"Ceramo" thermocouple wires are made in Iron-Constantan, Chromel-Alumel, Copper-Constantan, Chromel-Constantan, and Platinum-Rhodium Platinum. Wires are sheathed with seamless tubing of stainless steels, Inconel, aluminum, or copper. Made with 30, 22 and 16 gage conductor material; overall diameters of 1/16", 1/8", and 1/4" respectively; lengths up to 30 ft.

"Ceramo" thermocouple extension wires are made in Iron-Constantan, Chromel-Alumel, or Copper-Constantan with copper-nickel alloy, plain or galvanized cold drawn steel sheath overall. Made with 20 and 16 gage conductor material; overall diameters of 1/8" and 1/4" respectively; lengths up to 2000 ft., depending on the type of metal tubing and outside diameter. "Ceramo" is made also in single conductors or multiconductor cables.

Interested? Write for bulletin 31-300-R.

Pyrometers • Temperature Monitoring Systems • Thermocouples • Protection Tubes
Quick-Coupling Connectors and Panels • Thermocouple and Extension Wires

Thermo Electric Co., Inc.
SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 6861 opposite last page

INSTRUMENTATION

Describes measurement equipment for liquid chemicals

Illustrated 12-page booklet describes design and operation of stainless steel industrial meters for specific applications in chemical, petrochemical, pharmaceutical and processing fields. Remote registration equipment for centralized batching and flow control; and multi-stage quantity control valves to eliminate hydraulic line shock from abrupt shut-off are also described.

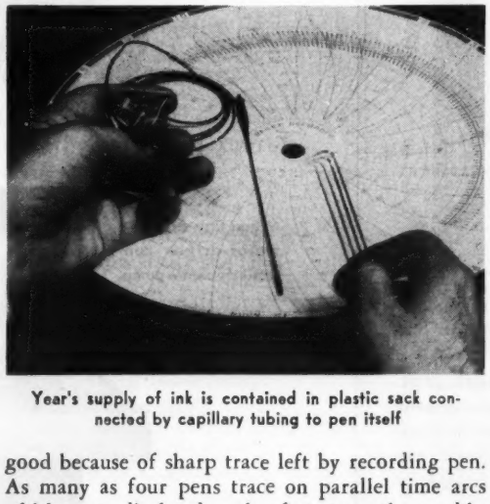
Bul O.G. 406 is available from Meter and Valve Div., Dept. CP, Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa. When inquiring specify CP 6862 on handy form opposite last page.

Recorder pen only needs ink once a year — inksack is sealed . . .

small tip lets multiple pens trace within forty-two thousandths of an inch of one another

By using a hermetically-sealed plastic inksack with more than a one-year supply, manufacturer is able to produce a very lightweight stainless steel capillary pen for use in recorders.

Capillary action maintains continuous flow to a precision ground point which traces a sharp, quick-drying record. "Poisoning" of intersecting records is practically eliminated. Chart legibility is also



Year's supply of ink is contained in plastic sack connected by capillary tubing to pen itself

good because of sharp trace left by recording pen. As many as four pens trace on parallel time arcs which are displaced only forty-two thousandths of an inch from each other.

Sealed inking system prevents sludge and oxide formation. It is contamination-proof and neither corrosion nor evaporation have caused trouble.

Time the flow of Gas . . . Liquids . . . Solids in Split-Second Intervals with the POST INTERVAL TIMER

The Post electronic "Interval Timer" permits fractional second timing of any industrial operation. One or more different functions can be controlled by various models.

60 Cycle, line-current, is converted to 120 impulses per second. Desired "action-intervals" can be set in increments as fine as 1/120th of a second, and the timer will automatically time the operation. Controls are easily set . . . stay in position.

Filling operations, conveyor feeding, etc. are ideally solved by this latest Post development. Write for details.

Electronic Products Division
Dept. 551

POST
MACHINERY CO.
Beverly, Mass.

When inquiring check CP 6863 opposite last page

Pens have been run on equivalent of a 15-year accelerated test at ambient temperatures from 20 to 140°F without breakdown or visible wear. Pens are designed for exclusive use in manufacturer's recorder.

(Capillary pens have been developed by Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland 10, Ohio . . . or for more information check CP 6864 on handy form opposite last page.)

Switch is built into meter to cut or start pumps, agitators . . .

featured in units for 1 to 4" pipe with capacity to 500 gpm

Uses: Switch built into meter can be used to automatically turn pumps on or off, actuate solenoid valves, start agitators, control other cycling operations when a preset quantity of material has been pumped through meter.

Features: Built-in switch is actuated automatically. Operator need only start equipment to have perfect cycle take place without further attention.

Description: Explosion-proof electrical switch is built into integrating meter. A Microswitch, it is rated for 15 amp, 125, 250, or 460v AC SPST normally open or normally closed.

Typical operation is started when operator turns knob to clear register of meter to zero. He pushes buttons to set register for required number of gallons or pounds of liquid to be delivered. When valve is open to start cycle, switch is also actuated. Switch may start agitator motor, open remote valve, etc. When desired quantity of material has been delivered, register trips stop valve (shutting off line) and at the same time actuates electrical switch in opposite direction.

In meters where automatically closing valve is not a feature, cycle is similar except that it is started by turning knob in back of register. Register can be set up quickly by pressing buttons. Large numerals on meter face keep pace with flow. This provides visual check when delivery is finished. Flow can be stopped at any time by pressing emergency stop button.

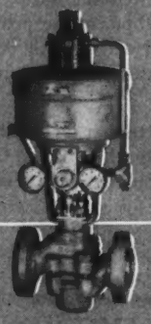
Switch is available on meters ranging in size from 1 to 4" pipe with flow rates to 500 gpm. It is also available in combination with the automatic shut-off valve for pipe sizes from 1 to 3" and rates to 300 gpm.

(Auto-Switch Meter is a development of Neptune Meter Co., Dept. CP, 19 W. 50th St., New York 20, N. Y. . . . or for more information check CP 6865 on the convenient Reader Service slip which is located opposite last page.)

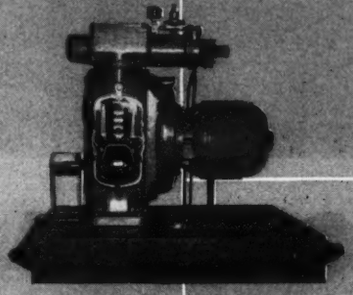
CONOFLOW *Cylinder Conomotors*
now make possible a *complete selection* of
FINAL CONTROL ELEMENTS

CONVENTIONAL—Control Valve

One of the most conventional methods of controlling practically any variable is to use a control valve to regulate the fluid stream on the discharge side of a pump or similar prime mover. This is, of course, a simple and obvious approach, but frequently poses serious problems especially when handling extremely viscous materials, abrasive materials, corrosive fluids, etc. One of the proved and accepted methods of hurdling these perplexing obstacles is to control at the source by positioning . . . . .



Conoflow Series LB Control Valve



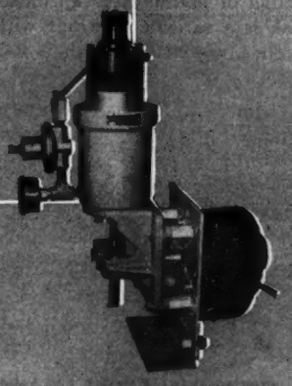
Cylinder Conomotor actuating variable speed drive (Link Belt)

. . . . . THE PRIME MOVER—*mechanically*

In this manner the prime mover is actuated directly by the control instrument—eliminating the necessity of breaking into the line downstream to install a control valve. A most common method of accomplishing this is to control the pump speed by means of a mechanical variable speed transmission. Cylinder Conomotors are available as original equipment on a wide variety of drive units similar to the one illustrated here, including U. S. Electrical Motors, Sterling Electric Motors, Graham Transmissions, Reeves Pulley, etc. Many pumps have been adapted for direct control by using Cylinder Conomotors to automatically adjust pump stroke as in the Lapp Pulsafeeder and Milton Roy pumps. In some cases it is more practical to control at the source through electrical means by modulating . . . . .

. . . . . THE PRIME MOVER—*electrically*

Conoflow EB Current Controllers operating from a 3-15 or other standard range pneumatic controller are available in over 200 combinations of electrical components for controlling voltage, current, inductance, capacitance, resistance or other electrical values. A common approach to the regulation of fluid flow in this manner is to position the rheostat in the motor field or the armature circuit as a direct function of signal pressure, thereby regulating the speed of the D.C. shunt-wound motor driving the pump. On many applications, variable speed transmissions and electric motors can be controlled from zero to full capacity offering a resultant control range that cannot be matched by conventional control valves. In installations involving large capacity equipment this can prove extremely important since it eliminates the needless operation of large centrifugal pumps running at constant speed wasting power by discharging against a stalled or greatly restricted head.



Conoflow EB Current Controller positioning rheostat

For additional information on Conoflow Cylinder Operators write for Bulletin B-50-2.

CONOFLOW CORPORATION
FOREMOST MANUFACTURERS OF FINAL CONTROL ELEMENTS
2100 ARCH STREET, PHILADELPHIA 3, PA.

When inquiring check CP 6866 opposite last page

Revised electronic dictionary contains 3500 terms

Ranging from historic terms to the new language of color television and nuclear physics, 3500 words are defined in electronic dictionary. Modern techniques and equipment are covered. Over 150 illustrations and diagrams of components, equipment, and electronic circuits are included in the 72 pages.

To obtain "Dictionary of Electronic Terms" remit 25c direct to Allied Radio Corporation, Dept. CP, 100 N. Western Ave., Chicago 80, Illinois.

Adjust thermoregulator for changes as small as 0.005°C . . .

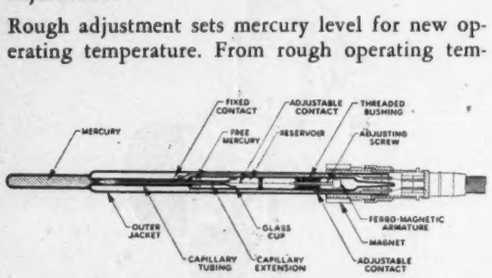
two regulators have ranges of minus 35 to 300°C and minus 35 to minus 60°C

Uses: Thermoregulator is designed for precise control of temperature circuits in viscosity baths and similar high precision work.

Features: Under favorable conditions constant temperature baths have been controlled within ±0.002°C. In ordinary service 0.005°C changes are sufficient to actuate mechanism.

Description: Two design features are held responsible for high performance specifications of this thermoregulator. One of these is a changed design for displaced mercury reservoir used in making rough or preliminary adjustments. Second design kink is a variable electrode with magnetically controlled micrometer which is used for fine adjustments.

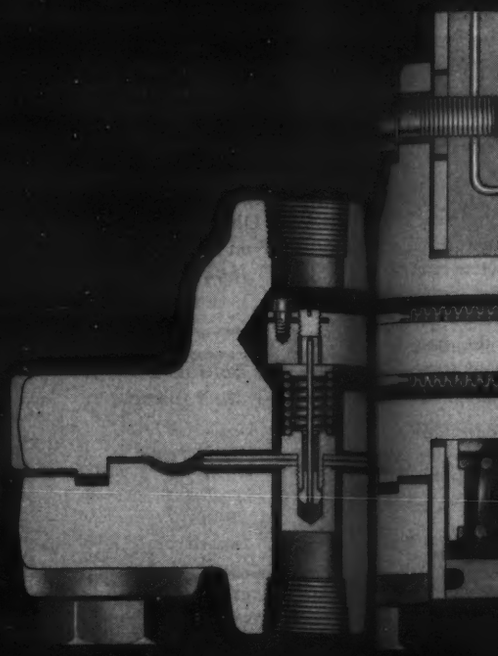
Rough adjustment sets mercury level for new operating temperature. From rough operating temperature thus reached, fine adjustment of precise operating temperature is made by twisting magnetic control. As magnet turns, it causes armature to rotate through micrometer. This controls position of variable electrode. By this adjustment it is possible to make changes in setting of as little as 0.005°C with magnetic control.



Sectional drawing shows armature and variable electrode in thermoregulator

Operating range for standard regulator is −35 to 300°C (minus 30 to 570°F). Special low-tempera-

FOR DIFFERENTIAL PRESSURE
FLOW
LIQUID LEVEL



ONLY A MASONEILAN Offers You All These Adv

Meticulous attention to design details pays off in minimizing errors previously experienced with this type transmitter. Here's why:

▶ Has standard Masoneilan balanced, amplifying relay type pilot.

▶ Air passages all contained in sturdy mechanism frame — no tubing or fittings used inside cover.

▶ Damping unit is *sealed* — damping fluid cannot be lost in any position of the instrument.

▶ Heavy section mechanism frame bolted directly to diaphragm housing, and cover mounted to a floating plate, eliminating distortion due to outside forces acting on case.

▶ Diaphragm housing is rugged AISI Type 316 stainless steel forging; avoids possibility of distortion from piping.

▶ Self-aligning, friction-free flexure bearings of beryllium copper for greater strength.

▶ Mounting is on diaphragm housing — point of greatest mass — insuring sturdy installation (see illustration at right).

▶ Adjustments provided with locks to insure retention of calibration.

▶ Overrange protection provided for differential pressure equal to maximum static rating. Diaphragm protected against overload or negative differential.

▶ Extra he minimizes b

▶ Drain co point in diapl connections diaphragm proper vent drainage of high and low

▶ Materials

MASO 1203

Sales Offices or Dist Philadelphia • Ho Boise • Louisville Corpus Chr

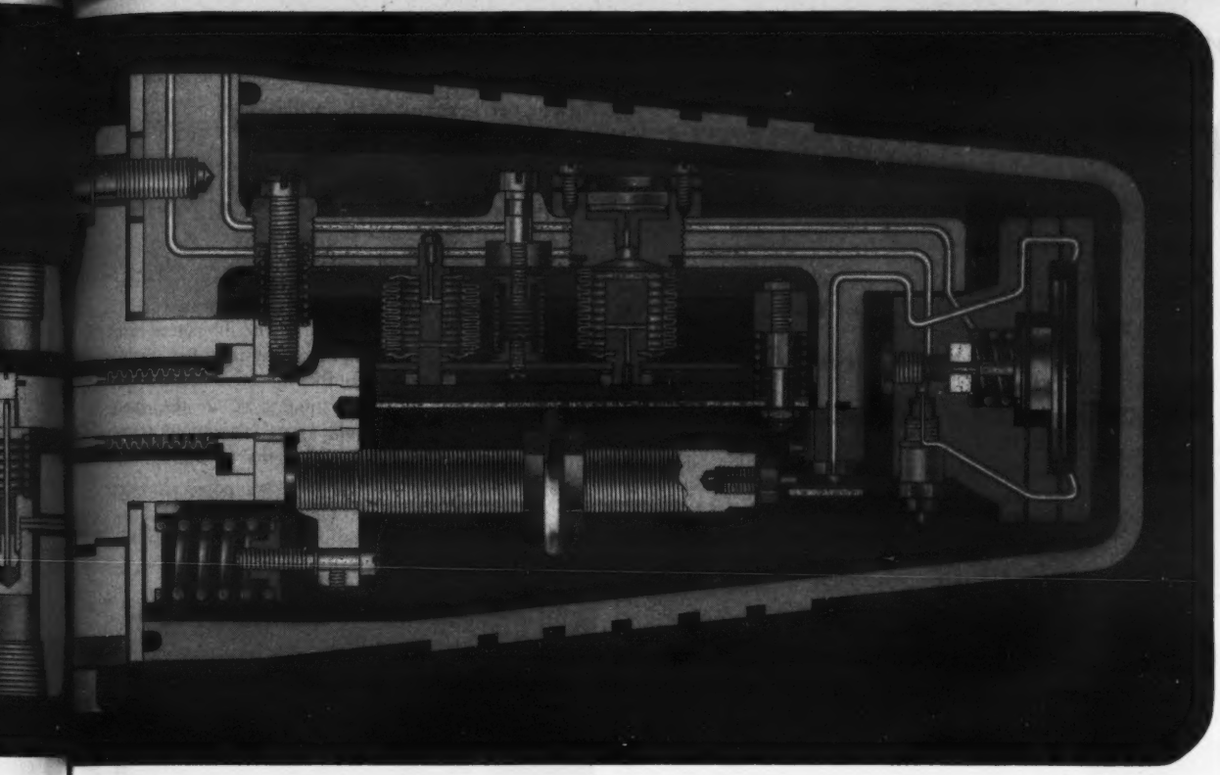
ture unit has operating range of −35 to −60°C (minus 30 to minus 76°F).

(Magna-Set is a development of Precision Thermometer & Instrument Co., Dept. CP, 1434 Brandywine St., Philadelphia 30, Pa. . . . or for more information reader may simply check CP 6868 on convenient Reader Service slip which is located opposite last page.)

Shows automatic production of halogen acids

Picturing automatic production and control of high-strength halogen acids, hydrochloric and hydrofluoric, four-page bulletin in two colors explains falling-film absorbers and instrumentation. Control system described throttles feed water in response to weak acid temperature. Suggested uses include absorption of ammonia and other gases in production of insecticides, repellants, plastics, pharmaceuticals, chlorinated chemicals.

IDS 2.5-11 is issued by the Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Avenues, Philadelphia 44, Pa. When inquiring about manufacturer's product reader may simply check CP 6869 on the convenient Reader Service slip which is located opposite last page.



4800 DP TRANSMITTER

Advantages in One Instrument

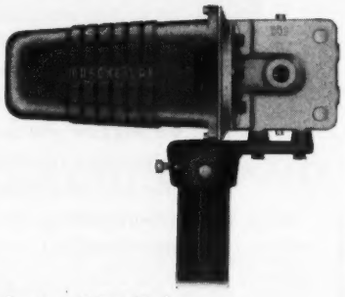
▸ Extra heavy primary beam minimizes bending.

▸ Drain connections at lowest point in diaphragm housing; vent connections at highest point in diaphragm housing — insures proper venting and complete drainage of condensate on both high and low sides.

▸ Materials selected for maximum strength and accuracy with highest corrosion resistance and minimum temperature error (1% per 100° F ambient temperature change).

▸ These and other design features make Masoneilan Model 4800 Differential Pressure Transmitters outstanding among instruments of this type. Write for complete information.

SPECIFICATIONS



Range — Adjustable from 20" to 200" H_2O
Static Pressure Rating — 1500 psi
Ambient Temperature Rating — minus 30°F to plus 180°F
Weight — approximately 30 lb.
Pressure Connections — ½" NPT internal
Air Supply — 20 psi
Output — 3-15 psi

MASONEILAN

MASON-NEILAN REGULATOR CO.
1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa • Charlotte • Los Angeles Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

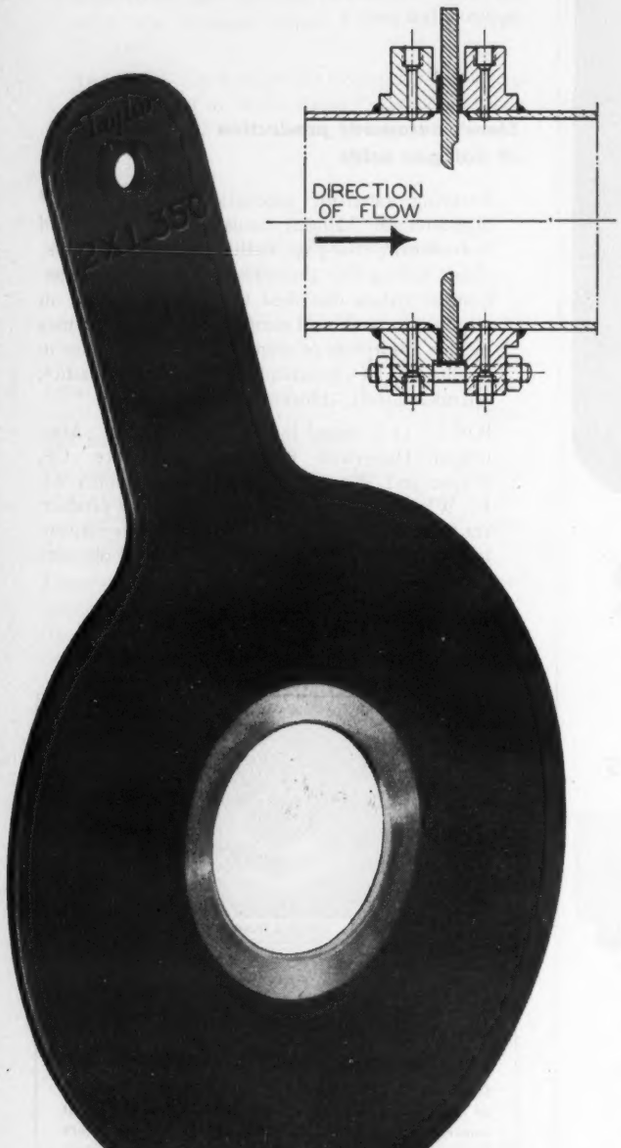
When inquiring check CP 6867 opposite last page

Designed to remove solid or liquid particles from air or gas lines, low cost filter even extracts cigaret smoke. Replaceable discs produce low back pressure (0.2" water at 110 cu in per min when new). Temperature rating of standard unit is 300°F; of special unit, 1200°F. Discs (three extra supplied with filter) are changed by removing screws shown above and must be handled carefully. Cigaret smoke trick will test newly installed disc.

(Line filter is a product of Charles Engelhard, Inc., Dept. CP, 850 Passaic Ave., E. Newark, N. J. . . . or for more information check CP 6870 on handy form opposite last page.)

New improved measurement of

LOW FLOWS WITH VARYING VISCOSITY



AS A RESULT OF TAYLOR'S BROAD EXPERIENCE WITH QUADRANT EDGED ORIFICE

THE Quadrant Edged Orifice is the result of considerable effort to find a primary element suitable for low Reynolds number flow measurement. This type of flow is encountered when viscosity is a factor both in magnitude and variation. The orifice edge has a rounded approach on its upstream face making it practically insensitive to viscosity changes so long as the throat Reynolds number does not exceed 250,000. For all practical purposes it has a constant coefficient over the Reynolds number range of 5000 to 250,000. Calibration curves are therefore unnecessary—standard square root charts can be used even on low flows. This constant coefficient characteristic permits the use of an integrator in the recorder or a planimeter with the charts.

Our experience has shown that unusual machining skills are required to produce this type of orifice satisfactorily—the edge contour being extremely important. If you have flow measurement problems that could benefit from the use of this Quadrant Edged Orifice, we suggest you submit them to Taylor for analysis and recommendation. Meantime write for technical bulletin to Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

• • •

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Taylor Instruments MEAN ACCURACY FIRST

When inquiring check CP 6871 opposite last page

Power for resistance thermometers high enough to produce high output . . .

power supply designed for special probes in −70 to 500°F temperature range

To produce high signal voltages in measuring temperatures, engineering studies have indicated that use of properly powered resistance thermometers can eliminate amplifying equipment. System has been worked out to permit flexibility of measurement of various ranges. Further advantages lie in the fact that a large number of probe types for various temperature spans need not be stocked.

Heart of this system is a balance and power supply unit which excites probes. One such supply can provide range and sensitivity adjustments for 25 measuring channels. Temperature-proportional voltage is linear and outputs of many types can be supplied to recording or transmitting systems.

Provides range and sensitivity adjustments for 25 resistance thermometers

Probes have good response time and are designed to operate in the range from −70 to 500°F. Probe designs include those for surface, structure, miniature component, liquid, and gaseous temperature measurements.

(High level resistance thermometer systems are designed by Department CG-1, Arnoux Corporation, Department CP, 1357 S. Hawthorne Boulevard, Hawthorne, California . . . or for more information reader may simply check CP 6872 on convenient Reader Service slip which is located opposite last page.)

Need instrumentation for that process?

You'll find just what you need in the alphabetized, itemized Product Directory on pages 214 to 217. All subjects and products presented in ads and editorial columns are there.

Start two horsepower motor directly from relay — no contactor . . .

delay is adjustable from ½ to 6 seconds; voltages range from 120 to 600

Uses: Provides time delay from ½ to 6 seconds for standard AC voltages from 120 to 600 at 60 cycles. DC and non-standard frequency AC relays are also available. Relay was specially designed for use with self-braking AC motors.

Features: No contactor box is needed with this relay for motors up to 2 or 3 horsepower. Contact ratings are 10 amp at 440 volt.

Description: Relay is designed so that it may be used as a "single pulse" time delay device or for electric motor braking. As a "single pulse" relay it closes with each momentary closing of push

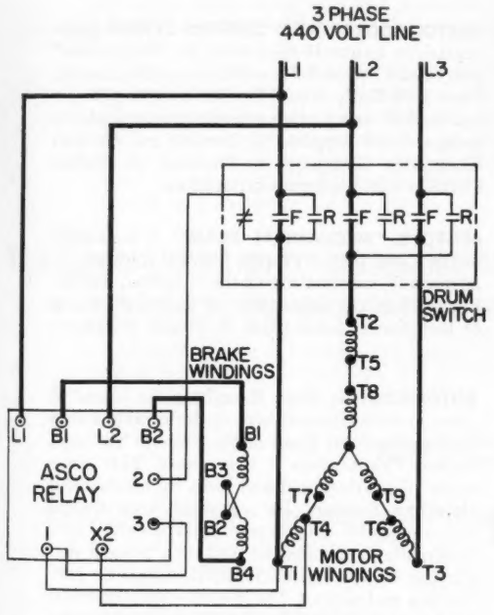


Diagram shows connections for electric motor braking

button. This connects line to controlled equipment. Relay automatically disconnects equipment ½ to 6 seconds later depending on setting.

Repeated cycling can be arranged with this device also — equipment would then contact and drop off line at intervals of ½ to 6 seconds as required.

When used for braking motors, time delay relay closes and energizes brake winding when drum switch is rotated to motor stop position. Relay automatically disconnects brake winding ½ to 6 seconds later depending on setting.

(Time Delay Relay is manufactured by Automatic Switch Co., Dept. CP, 391 Lakeside Ave., Orange, N. J. Check CP 6873 on handy form opp. last page.)

ANNIN DEVELOPED AND INTRODUCED:

SPLIT BODY
The Annin split-body design has given Industry new standards in control valve construction: lower body pressure loss, greatly reduced erosion, greater rangeability, longer life and reduced maintenance.

DOMOTOR OPERATOR
Out-performs all other pneumatic valve actuators. They are the highest speed, most powerful, and provide the best response characteristics. Long strokes assure that all size valves are truly hi-lift control valves.

TEFLON SEAT SEAL
The teflon seat seal for absolute tight closure, teflon guide bushing to eliminate guide clearance, and teflon V-ring packing for reliable stuffing-box performance were developed and introduced by Annin.

DOOLSEAL
Providing a new high in stuffing-box practice, the Doolseal, originally developed and introduced by Annin, assures reliable seal for hard-to-handle or toxic chemicals without resorting to mechanical seals.

...and many others!

CUT INVENTORY 50% WITH

ANNIN *Control* VALVES

THE ANNIN COMPANY
6570 East Telegraph Road
Los Angeles 22, California

When inquiring check CP 6874 opposite last page

Indicates and controls temps to 3000°F

Detailed specifications and four wiring applications are shown in five-page bulletin on controller-indicator pyrometers. Ten ranges cover temperatures from 0 to 3000°F. Four styles are pictured, fixed and portable.

Features listed include 10-amp contact rating, thermocouple break protection, welded steel construction. Movement sensitivity is approx 7ohms/-mv.

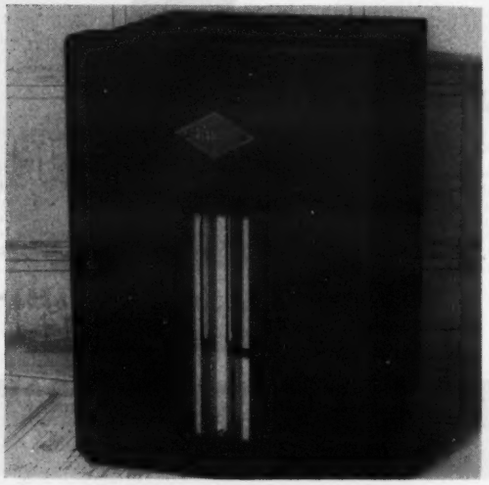
Bul 4S-14 is available from Illinos Testing Laboratories, Inc., Dept. CP, 420 N. LaSalle Street, Chicago 10, Illinois. When inquiring about manufacturer's product, reader may simply specify CP 6875 on handy form opposite last page.

Pressure comparator takes action when pre-set difference is reached . . .

will start screen cleaner, for example, when back pressure gets too high

In a typical use, differential monitor measures water level differential between upstream and downstream sides of a screen. It actuates screen cleaning mechanism when differential exceeds set limits — indicating that screen is filling.

Measuring 11 x 17 x 11 inches, monitor includes a manometer, switch-and-relay, and connections for quarter-inch pipe. Standard bubble tubes in liquids to be measured are connected to pipe connections. One of these goes to each side of manometer. Electronic switch senses position of fluid in ma-

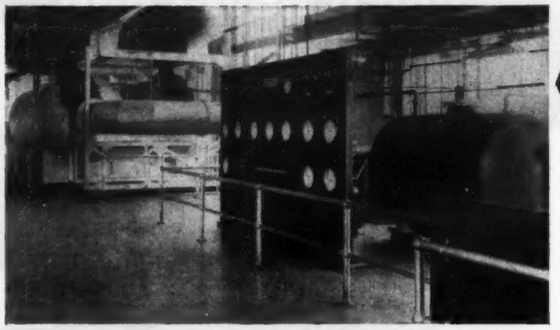


Differential level is shown by manometer

WHAT'S NEWS AT BRISTOL . . . WHAT'S NEWS AT BRISTOL

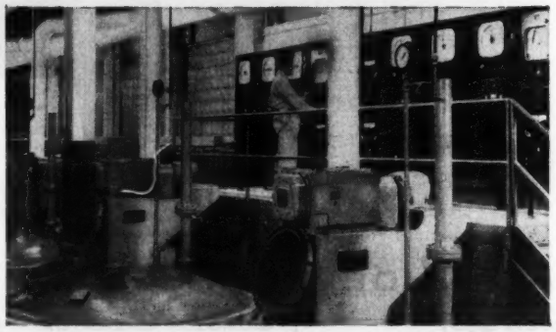
Bristol...automation... and you

Magic word, automation. Or push-button operation. It's a breath-taking concept, too — plants running practically unattended.
Breath-taking — but not *new*.

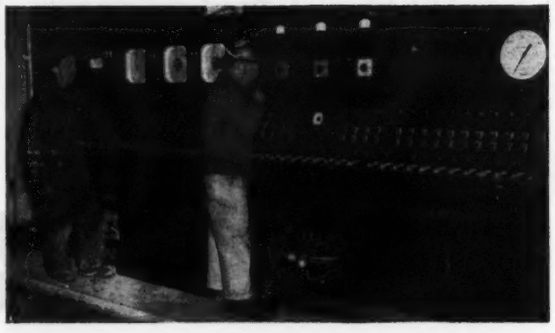


BRISTOL COORDINATED CONTROL SYSTEM automatically controls operation of "Columbia" Activated Carbon Solvent Recovery Plant at the New York Daily News. Similar control systems are used in many other solvent recovery plants designed and supplied by Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation.

BRISTOL'S "MECHANICAL BRAIN" is the leader of the Coordinated Process Control System . . . accurately coordinating all the variables, including mechanical operations, so that each phase of the process takes place in proper sequence.



AUTOMATION is often thought of in terms of plans or even dreams; here at the Buffalo Foam Rubber Products Plant of the Dunlop Tire and Rubber Corporation, it is a reality. This automatic plant, designed and built by Mechanical Handling Systems, Inc., Detroit, uses Bristol Dynamaster® Electronic Instruments and Automatic Controllers as part of a process employing today's most advanced automatic production techniques. The result — greater efficiency and productivity, lower costs, improved product, and stronger competitive position.



THE WORLD'S LARGEST COAL CLEANING PLANT employs automation in lubricating system. The Hanna Coal Co., Adena, Ohio, uses *Bristol Controls and Recorders* in its fully automatic time-controlled centralized system for mass lubrication. This system promotes safety and, above all, insures positive delivery of the right lubricant in the right quantities at the right time to all bearings, regardless of operating conditions.

Twenty-one years ago . . .

'Way back in 1934, The Bristol Company led the way in the field of automation by developing the Bristol Systems of Coordinated Process Control.

These systems automatically controlled and coordinated all of the variables and operations of a process—such as the time of operation of valves, pumps, blowers, dampers, and the control, at a definite value or according to a time program, of variables that affected the uniformity, quality, cost, and yield of a product – such as temperature, pressure, liquid level, flow, pH, humidity, and speed.

RESULTS: They eliminated variations in processing that caused inefficiency – cut down rejections and waste – insured product uniformity – helped cut processing time as much as from 10 days to less than 30 minutes. And these systems quickly paid for themselves.

A REVOLUTIONARY CONCEPT: They brought automatic plant operation to a startling reality and were hailed at the time as a fundamentally new development – which would in time revolutionize manufacturing.

Today, Bristol Coordinated Control Systems are used in the chemical, oil refining, rubber, tobacco, textile, steel, metal working, food, paper, the automotive industries, and many others. They are so completely automatic that it is only necessary to push a button to start up, another to shut down.

The modern solution to processing and manufacturing control problems

Bristol's System of Coordinated Process Control is made possible only by the following unique combination of facilities, which have been developed during 66 years of building and applying thousands of automatic control systems and instruments in practically all industries:

1. The complete line of modern Bristol Automatic, Controlling, Recording, Electronic, and Telemetering Instruments, representing some of the most advanced ideas in instrument engineering.
2. Bristol's Fully-Automatic Time-Cycle Controllers or "Mechanical Brains".
3. Bristol's ability to combine electronics and the mechanical phases of automation.
4. The ability and facilities of Bristol's engineering staff, gained by long experience and Bristol's pioneering work in the field of automation.

Bristol Application Engineering is at your service:

Our application and field engineers are ready to solve control problems involving automation and Coordinated Process Control Systems by working jointly with your research, development, and plant engineers.

Have you an automation problem?

Our application engineers and nation-wide group of field engineers would like an opportunity to work with your technical staff on any problems of automation for which Bristol Controlling and Recording Equipment and Bristol Coordinated Control Systems appear to be the solution. 5.3

BRISTOL PRODUCTS:

Automatic Controlling, Recording, and Telemetering Instruments for:

Pressure, Vacuum, Absolute Pressure, Draft, Differential Pressure, and Barometric Pressure.
Temperature (Thermometers, Potentiometers and Pyrometers).
Flow, Water and Liquid Level, and Specific Gravity.
pH and Conductivity.
Speed of Travel and Rotation.
Humidity.
Voltage, Current, Power, and Load Totalization.
Mechanical Motion, Position and Operations

Including:

Automatic Control Systems
Electronic Potentiometers
Graphic Panel Instruments
Time-Cycle Controllers
Time-Program Controllers
Pneumatic and Electric Controllers
Instrument Panels
Control Valves

Write to The Bristol Company, 141 Bristol Road, Waterbury 20, Conn.

BRISTOL'S

BRISTOL

POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 6876 opposite last page

nometer and throws in relay when pre-set level is reached.

Operating either normally open or normally closed, relay can handle equipment to one hp directly or can be connected to a power contactor which fits inside instrument case.

Instrument case is gasketed sheet steel and designed for either wall or flush mounting. Electronic circuit is a plug-in chassis for servicing convenience. Unit weighs 60 lb.

(Model DL Differential Level Monitor is a product of Thermo Instruments Co., Dept. CP, 1310 County Road, Belmont, Calif. . . . or for more information check CP 6877 on handy form opposite last page.)

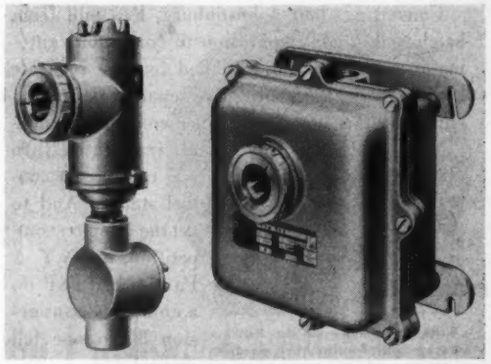
Light-sensitive controls safe for use in hazardous areas

Uses: System automatically activates or turns off lights, starts or stops motors, and controls other electrical or electronic devices.

Features: Explosion-proof and classified for use at Class I, Group D locations by UL.

Description: Light source transmitter and photoelectric tube receiver use appearance or absence of light to operate relay and open or close circuits.

Transmitter housing is cylindrical and has threaded adjustable focusing ring with converging lens and



Light source transmitter (left) and detector (right) are safe to use in hazardous areas

outer explosion-proof window. Lens focal limits are from infinity to point 6" from lens. Six-volt auto lamp provides light source. Lamp life is approximately 2500 hours.

Receiver consists of phototube receiver with lens, phototube, thyratron, electronic amplifier, relay.

(Controls are products of Crouse-Hinds Co., Dept. CP, Wolf & 7th North Streets, Syracuse, N.Y. . . . or check CP 6878 on handy form opposite last pg.)

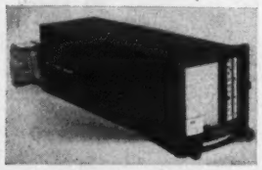
The New York & Pennsylvania Company found that...

for complete process instrumentation

ONE SOURCE STANDS OUT!

Like other leading companies, the New York & Pennsylvania Company, makers of fine book and specialty papers, found that Fischer & Porter offered them integrated instrumentation and control systems — *all from a single source.*

Converting their Johnsonburg, Pa., mill from batch-type stock preparation to continuous automatic stock preparation called for five separate blending systems feeding five separate paper machines, plus a complete refiner control system — all integrated into one centralized control station. And to get the jump on competition, the N.Y. & Pa. Co. had F&P do a complete conversion all in one fell swoop!



Write for details on the F&P Ratographic* miniature pneumatic recorder-controller, offering 4-inch strip chart record.
*T.M., F&P Co.

From one source, the N.Y. & Pa. Company obtained the engineering experience and know-how to design and instrument the system, the specialized meters (e.g., Ratosleeve* stock meters) and valves (e.g., Ratogate* stock valves) and instruments (all of F&P design and manufacture) to control the processes, and the complete panel fabrication right down to the last graphic symbol.

Because the complete package was obtained from one team, responsibility for delivery and performance was not divided, the cost far less. Perfectly matched instruments, rather than non-mating components, meant complete satisfaction for this customer.

Write today and tell F&P your needs — the answers will be yours quickly, without obligation. Compare and you must agree — F&P *is the one source that stands out.*

complete process instrumentation

FISCHER & PORTER CO.

2155 County Line Road, Hatboro, Pa.

LA 1028

MEASURING, RECORDING AND CONTROLLING INSTRUMENTS • CONTROL PANELS • DATA REDUCTION SYSTEMS
CONTRACT INSTRUMENTATION RESEARCH • CHLORINATION EQUIPMENT • INDUSTRIAL GLASS PRODUCTS

When inquiring check CP 6879 opposite last page

Precalibrated, air receiver plugs in, makes recorder change possible in one hour . . .

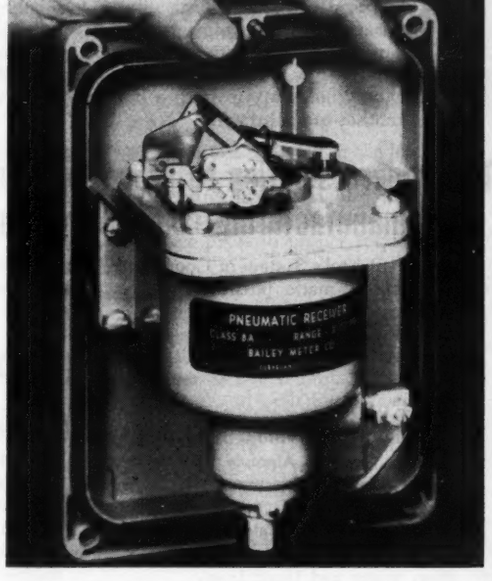
receiver is factory calibrated for ±½ per cent of range span of either 3-15 or 3-27 psi

Uses: Designed as unitized plug-in receiver for manufacturer's pneumatic recorders.

Features: Receiving units are factory calibrated for use with any pneumatic transmitter in standard 3-15 or 3-27 psig ranges.

Description: Pneumatic receiver is designed to mount in manufacturer's standard recording instruments. It is capable of driving recording pen for range for which it is designed.

Unitized plug-in construction is made possible by pin-positioned mounting and indexed drive arm.



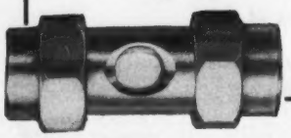
Interchangeability of pneumatic receiver is aided by indexed drive arm

Precalibration and unitization make it possible to place receiver in operation within one hour from the time it is taken from shelf. One receiver can be substituted for another in a matter of minutes.

Factory calibration is to less than ±½ of one per cent of range span. Sensitivity of receiver to signal changes is 0.01 psi. Ambient temperature changes between 30°F and 130°F are compensated by an isoelastic spring. Hysteresis is negligible.

(Plug-in pneumatic receiver is manufactured by Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland 10, Ohio. Check CP 6880 opp. last page.)

SEE INSIDE YOUR FLUID LINES WITH THE NEW LIQUID EYE®



INDICATOR
3000 SERIES
(ILLUSTRATED)

3000 series features:

- High pressure Pyrex sight glass.
- Pressure-sealed Neoprene sealing rings at both ends.
- Withstands operating pressures of 600 psi. and temperatures of 300° F. continuously.
- Unrestricted full line flow.
- Ruggedly constructed of cadmium plated steel.
- Ideal for wide variety of applications.

Available in ¾", 1" and 1-¼" i.p.s. and ¼" thru 1-⅛" tube sizes.

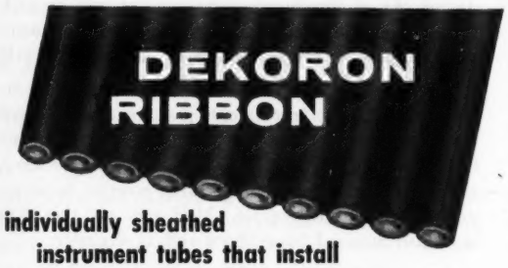
You'll find there's a "LIQUID EYE" designed to fit your application, too. An Allin representative is ready to help you choose from a most complete line of *Liquid Eyes*, or work with you on any special design.

Send for Catalog D-55 covering the complete Allin line.

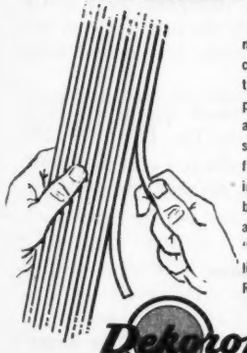
Allin MANUFACTURING COMPANY
1153 W. Grand Ave., Chicago 22, Ill.

When inquiring check CP 6881 opposite last page

DEKORON RIBBON



individually sheathed instrument tubes that install in a fraction of the usual time



Dekoron Ribbon is a new concept in multiple tube instrument line—a strip of 10 copper, aluminum, or "P" (polyethylene) tubes each individually coated with vinyl plastic. A thin "web" of vinyl attaches adjacent tubes together . . . yet is perforated so that one or more tubes can be stripped from the ribbon without tools. Thus, each individual tube is protected from corrosion by its covering while in the ribbon as well as after being peeled from the ribbon. "P" tube Dekoron Ribbon is color coded for line identification. Lengths to 500 feet. Request free literature on Dekoron Ribbon. AA-749

Dekoron® products

QUALITY • RESEARCH • SERVICE
SAMUEL MOORE & COMPANY
DEKORON PRODUCTS DIVISION • MANTUA, OHIO

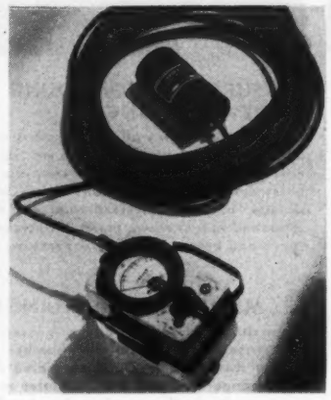
When inquiring check CP 6882 opposite last page

Only ionization chamber moved to hot spot in gamma meter

Uses: Designed for measurement of gamma radiation with intensities from 0.01 mr/hr to more than 100 r/hr.

Features: Only ionization chamber need be placed in the radiation hazard area. Fifty foot cable isolates meter unit.

Description: By isolating ionization chamber (Neher-White design) with a 50′ cable, radiation meter can be read without binoculars or optical systems. Chamber is small, rugged, and shock-insulated in fiber glass. Chamber will operate over the range from −65 to 250°F. It can be continually submerged in water. Chamber measures 4½ x 2½ inch diam.

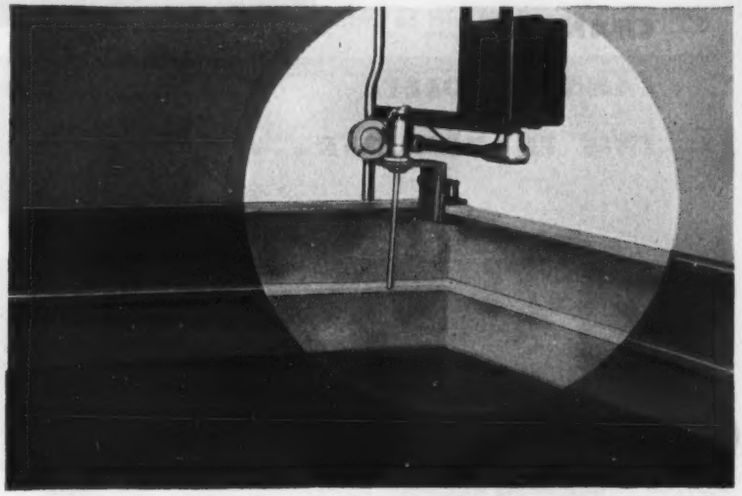


Ionization chamber is 4½ by 2½" diameter

Instrument design eliminates high voltage batteries, vibrator or rectifier power supplies, and very-high resistance resistors. No electron tubes are used to amplify chamber output. Battery life runs one to two years in normal service. Standard range is 0.5 mr/hr to 500 r/hr in two three-decade ranges.

(File 1531 explains this Radector made by Jordan Electronic Mfg. Co., Inc., Dept. CP, 119 E. Union St., Pasadena 1, Calif. . . . or for more information about manufacturer's product, check CP 6883 on handy form opposite last page.)

TEKTOR Keeps Hershey Chocolate from Overflowing Open Tank

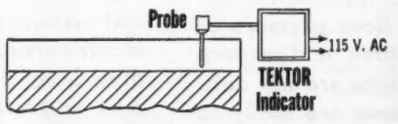


How to keep a 90,000 pound open milk chocolate storage tank from overflowing was the problem faced by the Hershey Chocolate Corporation.

Hershey Engineers found a solution by installing a Fielden TEKTOR High-Level Indicator Controller and Probe. Now, when chocolate level rises to 4 or 5 inches from the tank lip, this simple but dependable instrument flashes and sounds a warning so that the inflow of chocolate can be stopped.

Why TEKTOR Level Control is YOUR Solution

- Indicates or controls level of fluids, powders, solids (conducting or non-conducting)
- Electronically controls level as close as 1/16"
- A ready-to-install unit
- No moving parts . . . only one radio tube
- Regular plant personnel can maintain it
- Low first cost . . . low operating cost.



A TEKTOR probe is installed vertically and its electrical capacity changes when chocolate level is 4 or 5 inches from the lip of the tank. This de-energizes the Indicator relay and switches on the warning light and alarm.

Robertshaw-Fulton CONTROLS COMPANY

Send this coupon today, and find out how Fielden Simplified Instrumentation can solve your process control problems . . . accurately and economically.

FIELDEN INSTRUMENT DIVISION
2920 N. Fourth St., Dept. G, Philadelphia 33, Pa.
Please send me bulletins about your low-cost, accurate controls.

☐ TEKTOR Level Control
☐ Electronic Temperature Control
☐ Resistance Thermometer Recorder
☐ Proximity Meter

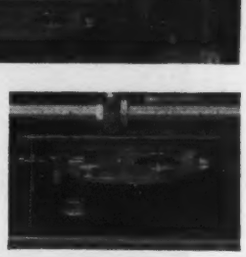
NAME_____ TITLE_____
COMPANY_____ ADDRESS_____
CITY_____ STATE_____

When inquiring check CP 6884 opposite last page

PROCESS CHANGES CAN'T OBSOLETE THIS TRANSMITTER . . .

❶ 10-1 RANGE CHANGE —NO CHANGE OF PARTS

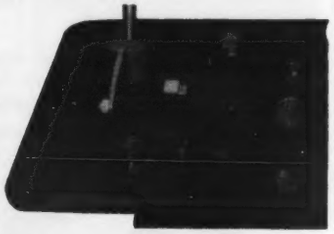
Double weighbeam construction on many models permits range changes as much as 10-1, just by turning a set of locking nuts to change a fulcrum point.



❷ ADDITIONAL 16-1 RANGE CHANGE—STILL NO PARTS CHANGE

Range may be changed on all models by loosening retaining bolts and sliding the reaction chamber to a new leverage position. Reaction area may be changed for further range change.

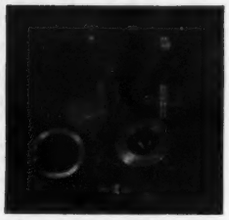
Process Model P-0331 with cover removed



❸ SUPPRESS, COMPOUND OR REVERSE RANGES

Balancing spring, installed to exert either an upward or downward force on transmitter weighbeam, quickly converts transmitter for range suppressions up to 80% of total range, for reversed ranges or for compound ranges where pressure fluctuates above and below atmospheric pressure.

REPUBLIC PNEUMATIC TRANSMITTER with EASY RANGE CHANGE



❹ MAJOR RANGE CHANGES

Range change plates may be easily inserted or removed from measuring chamber to change the effective diaphragm area for major range changes. Similar plates may be used also in the reaction chamber for further range change.

Here's the pneumatic transmitter for measuring differential, flow, pressure or level that saves you time and money when operating conditions are not definitely known or processes are likely to be changed. Extreme flexibility of design lets you adapt the same transmitter chassis for almost any range of measurements—often without any change of parts.

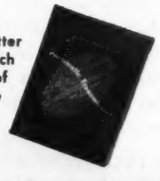
Process Model pictured above has a differential range of 0-12″ H_2O minimum and 0-880″ H_2O maximum at operating pressures to 1500 psig. Other models are available for differential ranges as low as 0-0.6 H_2O or as high as 0-750 psi.

Transmitters may be constructed of special materials to handle almost all types of corrosive fluids. Ruggedly built, they give long service out-of-doors. Accuracy is guaranteed at ½% of full range on standard models.

Republic transmitters are used in process, chemical and petroleum plants all over the country. Investigate their advantages for your plant.

FREE DATA BOOK

Get the full story about Republic transmitter flexibility. Send for free Data Book which gives all the facts about complete line of Republic transmitters, including Square Root Extracting and Pneumatic Electric models.



REPUBLIC FLOW METERS CO.

2240 Diversey Parkway, Chicago 47, Illinois

When inquiring check CP 6885 opposite last page

Reads 200 pressure indicators and types out pressure log accurate to 0.05% . . .

one part in 2000 accuracy is possible because of digital handling of data

Although designed for applications in windtunnel research and similar work where information has to be gathered in an instant, pressure logging system has features which could solve pilot plant and processing instrumentation headaches. Logger simultaneously samples up to 200 pressures. It records them digitally. It can also punch tape or cards. It produces a typed log accurate to one part in 2000.

Besides eliminating human error in making so many readings, logger attains standards of accuracy which are high even for automatic instruments. One reason for this is the digital handling of information.

System consists of a number of diaphragms with one signal pressure on one side and controlled pressure on the other. Each diaphragm is part of a comparator which is sealed off (on the signal side) by a solenoid valve. In this way all measurements are made at the same instant — the instant when the solenoids close. On other side of the diaphragms, a rising pressure "sweep" is introduced. As sweep pressure becomes equal to each signal pressure in turn, electrical contacts "memorize" signal reading. Following this sweep cycle a readout cycle begins.

Pressure reading instrument that measures *sweep* pressure which equals signal pressure is manufacturer's "Press-I-Cell." Differential transformer sends signal corresponding to diaphragm position to servo-positioned 200-inch scale. Markings on this film scale are detected by a photo cell as digitally.

In operation, entire reading procedure takes only two minutes from onset to emergence of a neatly typed log of pressures ready for use. Cycle of operation can be started manually or repeated automatically at fixed intervals.

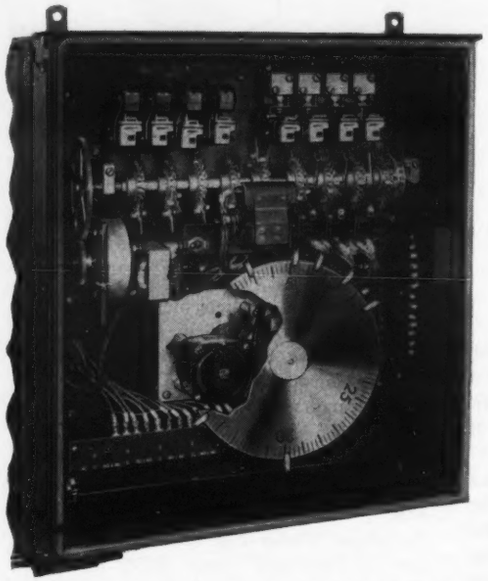
(This multiple pressure readout system had been developed by Fischer & Porter Co., Dept. CP, 269 Jacksonville Rd., Hatboro, Pa. . . . or for more information check CP 6886 opposite last page.)

Timer carries nine functions through 20 on-off steps

Uses: Automatically initiates and stops successive steps in a stop-and-go or on-and-off sequence from beginning to end of process.

Features: Program controllers operate from one to nine electric or pneumatic functions. Each function can be put through 20 on-and-off steps.

Description: Direct time settings are made on large dial by placing pens at corresponding intervals. Motors drive both time measuring device and a step disc mechanism which controls operation of controlled equipment. While designed specifically for tire presses, controllers may be easily rewired



Program is set up by moving pins directly on time dial

or adjusted to handle other batch processes. No computations are required in setting up or changing program — settings are made directly on time dial.

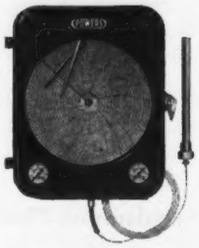
(Flex-O-Timer was developed by Taylor Instrument Companies, Dept. CP, 95 Ames St., Rochester 1, N. Y. . . . or for more information check CP 6887 on the convenient Reader Service slip which is located opposite last page.)

Shows correct sliderule for every job

Using many full-size illustrations, 32-page catalog shows sliderules for sales problems, research calculations, and special designs for engineering, drafting, quality control, accounting, many other special fields of applied mathematics. Comparison charts indicate best choices of sliderule for given jobs. Description and pictures of several inexpensive drawing instruments are also included.

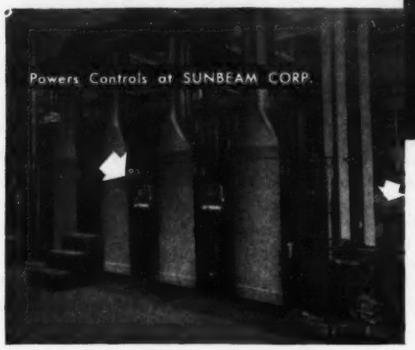
Catalog 164-A is issued by Pickett & Eckel, Inc., Dept. CP, 1109 S. Fremont Ave., Alhambra, Calif. When inquiring specify CP 6888 on handy form opposite last page.

Series 100 Temperature Indicating Controller. Below: Recording Controller.



FLOWRITE Diaphragm Control Valve.

Powers V-Port Characterized FLOWRITE Valves are outstanding for their extremely accurate control and continuous trouble free operation.

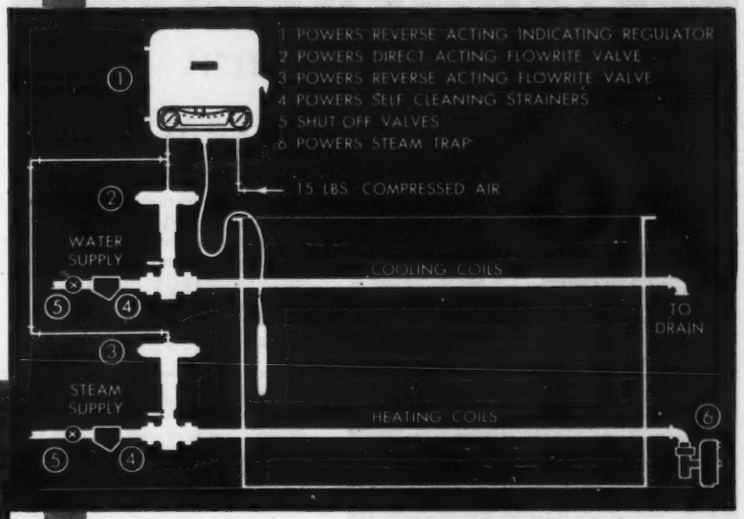


Below: POWERS No. 11 Self-Operating Temperature Regulators. Standard type (left) is widely used for water heaters, metal parts washers and many other processes. Ask for Bul. 329. No. 11-MF (right) is simplest, most dependable regulator made for 85% of Metal Finishing Processes. Has durable plastic thermal bulb and tubing highly resistant to various solutions. Easy to read 4" dial thermometer indicates temperature of solution under control. Ask for Bulletin 330.

For HEAT EXCHANGERS and metal parts washers Powers ACCRITEM air operated Temperature Regulator is used with FLOWRITE Valve above. Ask for Bulletin 316.

CUT LOSSES FROM REJECTS

and Get Better QUALITY Products from Processes Requiring Precise Control of HEATING and COOLING



install POWERS

Pneumatic TEMPERATURE CONTROL

QUICK RESPONSE to Temperature Changes is obtained with POWERS control when applied to processes where a heating cycle is followed by a cooling cycle or vice versa.

In the example illustrated above chromium or nickel plating solutions are controlled. Either a Powers Series 100 Recording or Indicating Controller may be used. As temperature of the solution in the tank rises to set point of controller it gradually shuts off valve on steam supply. If temperature in tank rises above the set point, the controller quickly opens the valve on the cooling water supply which accurately maintains the solution at a uniform temperature.

Safety Feature: If compressed air supply to the controller should fail, steam valve is automatically closed and water valve is opened preventing any damage which might occur from over-heating.

Accurate temperature control will help your employees turn out more work and improve QUALITY. Preventing overheating saves steam and helps obtain the most effective use from solution under control.

Check your temperature control requirements with an experienced POWERS engineer. With a complete line of self operating and pneumatic operated controls he can help you select the right type of control for your requirements.

POWERS CONTROL

THE POWERS REGULATOR COMPANY

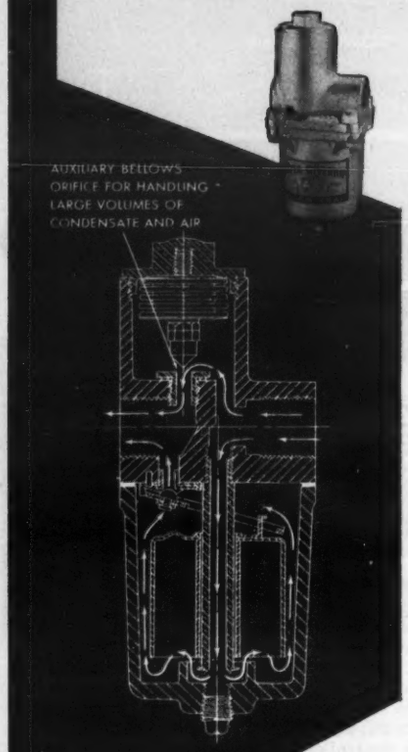
(b76)

SKOKIE, ILLINOIS • Offices in over 50 Cities in U. S. A., CANADA and MEXICO • See Your Phone Book

OVER 60 YEARS OF AUTOMATIC TEMPERATURE CONTROL

When inquiring check CP 6889 opposite last page

STOP CONDENSATE BACK-UP WITH HEAT-KWICK STEAM TRAPS!



● When production on your steam units fail . . . and you can't get consistent heat in your driers, cookers, kettles, unit heaters, etc., the chances are condensate is backing up into your equipment and cooling it off . . . actually decreasing its efficiency as much as 35%!

● Here's the remedy . . . Whenever you encounter pressure variations on your steam lines, or heavy condensate loads, or the need to vent air quickly, don't depend upon an ordinary steam trap to handle the job even if it has auxiliary air-venting devices. Call on Heat-Kwik traps, having two separate orifices, the conventional condensate orifice and a separate additional bellows orifice. Whenever a heavy load of condensate is encountered, this bellows orifice snaps into action. As soon as condensate hits the bellows, it opens and out goes the condensate in large volumes.

● For maximum efficiency on steam units, do the same as hundreds of other plants, insist on Super-Silvertop Heat-Kwik traps. Your steam units will operate at higher efficiency and at less cost than you ever dreamed possible!

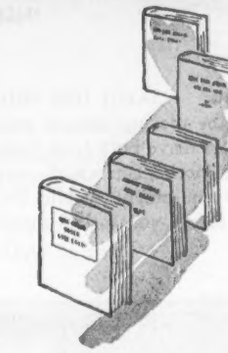
The V. D. ANDERSON Company
Subsidiary of Chesapeake Industries, Inc.
1932 West 96th Street, Cleveland 2, Ohio

WRITE FOR *Bulletin 1153. Tells how to prevent condensate from backing up with new Super-Silvertop Heat-Kwik Steam Traps.*

SUPER-SILVERTOP
HEAT-KWIKS
the Engineered Steam Trap by
ANDERSON

When inquiring check CP 6890 opposite last page

Recent Books



ASTM Standards on Plastics

Reviewed by WILLARD F. BARTOE
Chief Physicist
Rohm & Haas Company

The May 1954 issue of the "ASTM Standards on Plastics" contains 727 pages of information of real value to the organic plastics industry. Comprised primarily of 31 specifications for plastic materials, 117 methods of test and two score of related items, it is an essential handbook in the laboratories of both manufacturers and large consumers of plastic materials. Recognized as the standard reference work on plastics testing, it is a worthwhile addition to any technical library and should be required reading in any study course in plastics. The page references and appendices are a very helpful adjunct to the text.

Prepared in the usual expert manner of the ASTM headquarters staff, this volume suffers only from the absence of an alphabetically arranged subject index.

To obtain "ASTM Standards on Plastics" remit $5.75 *direct to the American Society for Testing Materials,* 1916 *Race St., Philadelphia* 3, *Pa. When inquiring specify CP* 6891 *on handy form opposite last page.*

Fisher/Tag Manual For Inspectors of Petroleum

(Staff Review)

This 28th edition of the Fisher/Tag manual presents a wealth of reliable information of prime importance to those engaged in testing petroleum products. Sections devoted to gravity, color, viscosity, distillation, gasoline quality, flash and fire points, sulfur, carbon and water residues, melting point, cloud point, pour point, and consistency include detailed procedures, tables, and factors that have their origin in the official methods of the American Society for Testing Materials.

The material is supplemented with data in graphical form, excellent cuts from the catalog of the Fisher Scientific Company, and an adequate index. Throughout the book paragraphs headed "Calculation," "Precision," "Reproducibility," and "Interpretation of Results" are most welcome. "Distinctly helpful" describes this 218-page book.

To obtain "Fisher/Tag Manual for Inspectors of Petroleum" remit $1.75 *direct to Fisher Scientific Co.,* 717 *Forbes St., Pittsburgh* 19, *Pa. When inquiring specify CP* 6892 *on handy form opposite last page.*

Colorimetric Methods of Analysis

Reviewed by SAMUEL SASS
Army Chemical Center, Maryland

This new volume by Foster Dee Snell and Cornelia T. Snell is a continuation of "Vol. III, Organic Compounds," which included methods for alcohols, ketones, oxides, phenols and other class compounds. The new book follows this collection of methods by describing procedures for the estimation of nitrogen compounds and compounds containing both nitrogen and sulfur. Included as a significant portion of the volume is a coverage of analyses for natural products such as sterols, hormones, alkaloids, enzymes, antibiotics, and others.

Wherever possible, interfering materials are discussed, including procedures for the separation of the compounds of interest from these interferences. Although descriptions are necessarily brief because of the large field covered, the cited references are conveniently located in the text.

reviews of current technical and reference works . . . summarized for you by authorities in the field working with the CP staff

This 676-page book is especially useful for pharmacological or toxicological studies as well as for process control of pharmaceutical or organics production. When used in conjunction with Vol. III it is a very practical reference source for general colorimetric organic analysis.

To obtain "Colorimetric Methods of Analysis" remit $12.50 *direct to D. Van Nostrand Co., Inc.,* 250 *Fourth Ave., New York* 10, *N. Y. When inquiring specify CP* 6893 *on handy form opposite last page.*

The Technology of Solvents and Plasticizers

(*Staff Review*)

A comprehensive (1056-page) volume, packed with tables of data (131 of them) and graphs (462), presents both general information ("General Survey of Solvent and Plasticizer Utilization") and specialized technology ("Thermodynamics of Polymer Solutions") on 161 solvents and 131 plasticizers.

Both "common" and proprietary materials used in the paint and plastics industries are covered. Usefulness of the book, however, overreaches into other fields: surface coatings, fibers, adhesives, inks. The subject is discussed from the point of view of application, with specific emphasis on helping the reader solve specific formulating problems.

Especially detailed is the chapter on properties of individual solvents. This covers 250 pages. Chapters on solvent recovery and handling and shipping are included.

Royalties from the volume will be used to finance an annual award for the outstanding scientific contribution reported in a technical paper before the Paint, Plastics, and Printing Ink Division of the American Chemical Society.

To obtain "The Technology of Solvents and Plasticizers," remit $18.50 *direct to John Wiley & Sons, Inc., Dept. CP,* 440 *Fourth Ave., New York* 16, *N.Y. Specify CP* 6894 *on handy form opposite last page.*

Micro and Semimicro Methods

Reviewed by V. J. SHINER, JR.
Assistant Professor of Chemistry
Indiana University

This is Volume VI of the series "Technique of Organic Chemistry" edited by Arnold Weissberger. It maintains the same high standards of binding and format which characterized the earlier volumes. The purpose of the author, Nicholas D. Cheronis of Brooklyn College, was "to give a critical and practical review of the microtechniques of preparative and analytical organic chemistry." The micromethods of elementary analysis are not included.

Micro and semimicro methods are treated in a parallel manner throughout the book which is divided into three approximately equal parts: I, General Methods; II, Preparative Reactions; and III, Analytical Procedures. Part I includes crystallization, distillation, miscellaneous laboratory operations and the measurement of physical constants. Part III treats mainly qualitative analysis and the identification of organic compounds; the chapter on "Quantitative Micromethods for the Estimation of Functional Groups" is too short to be very useful.

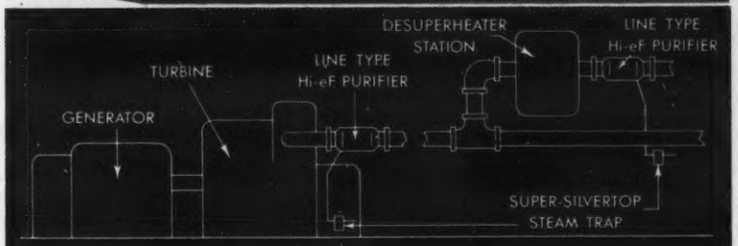
Good organization and indexing, many illustrations, and the author's clarity of expression combine to make this 628-page book an easy one to use. Numerous references have been included and the critical evaluation which can only stem from wide personal experience is one of the most valuable qualities of the book.

The reviewer was particularly impressed with the section concerning the standardization of melting point apparatus and technique. The section on fractional distillation would have been better if more emphasis had been placed on the concentrie tube and spinning band columns, which are uniquely well-suited for high efficiency separations on the semimicro scale.

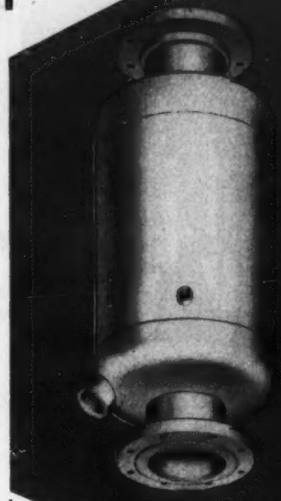
To obtain "Micro and Semimicro Methods" remit $12.00 *direct to Interscience Publishers, Inc.,* 250 *Fifth Ave., New York* 1, *N. Y. Specify CP* 6895 *opposite last page.*

(*Continued on next page*)

Case Study No. 102



Hi-eF® PURIFIERS PROTECT STEAM TURBINE...AND GUARANTEE DELIVERY OF DRY STEAM TO PROCESS EQUIPMENT



Typical proof of Hi-eF Purifier performance is this installation in a large Texas plant where three purifiers are giving excellent service.

One is a high pressure Hi-eF Purifier installed ahead of a steam turbine to protect this costly piece of equipment against accumulated slugs, line scale and mineral salts that might damage it. The other two are low pressure Hi-eF Purifiers installed immediately after two desuperheater stations to assure the distribution of clean, dry steam throughout the plant.

Company officials are enthusiastic about the quality maintained by the Hi-eF Purifiers. Since they have no moving parts they will continue to give maximum protection with a minimum of maintenance to the turbine and deliver dry, clean steam to the processing equipment for many years.

The V. D. ANDERSON Company
1959 West 96th Street, Cleveland 2, Ohio
Subsidiary of Chesapeake Industries, Inc.

Free!
Write for Bulletins 201 and 501 describing many money-saving applications with Hi-eF Line Type Purifiers.

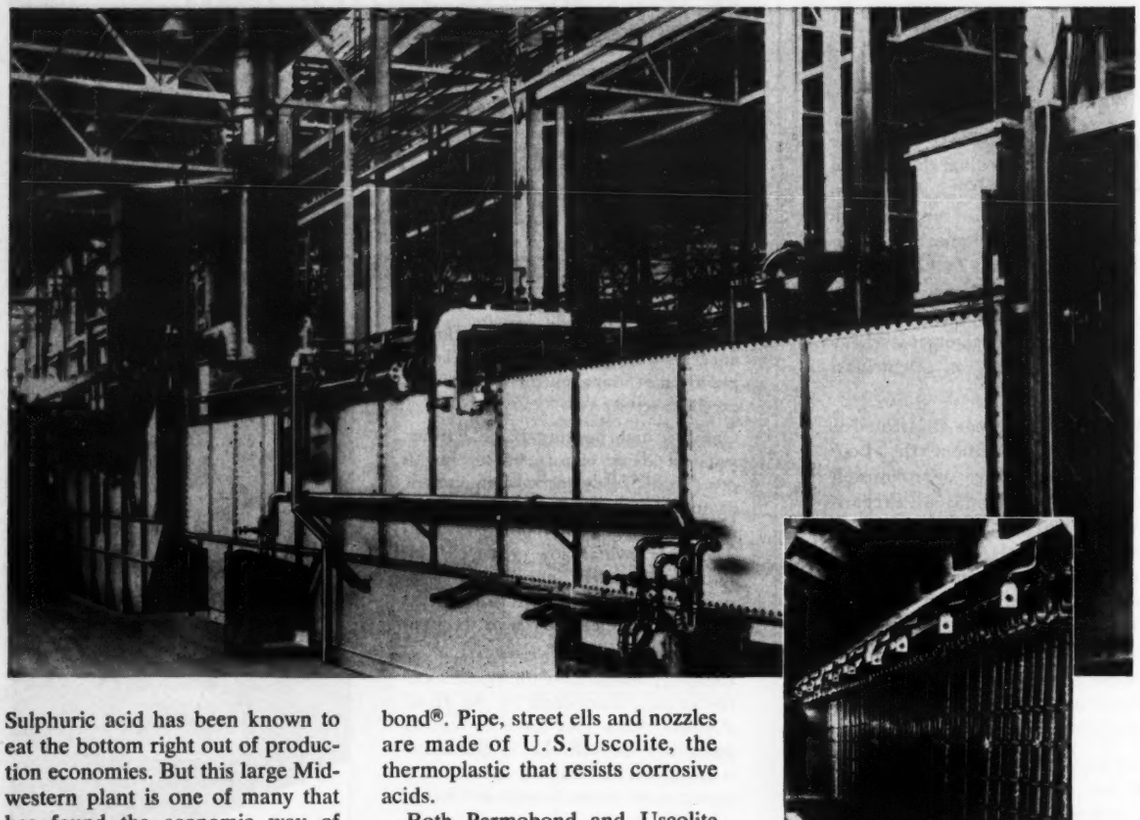
ANDERSON
Hi-eF® PURIFIERS

ANDERSON Hi-eF PURIFIERS

WATCHDOGS of Steam & Air, Gas • Vapor Pipelines & Equipment

When inquiring check CP 6896 opposite last page

Sulphuric acid tamed... when it flows through low-cost U. S. Rubber Linings and Pipe



Sulphuric acid has been known to eat the bottom right out of production economies. But this large Midwestern plant is one of many that has found the economic way of handling this highly corrosive acid. They use United States Rubber Company Linings and Uscolite® plastic pipe and fittings.

The pickling machine in this plant handles a 10% to 15% solution of sulphuric acid. The process tank, pipe and pipe headers, and internal surfaces of housings and plates are lined with U. S. Permobond®. Pipe, street ells and nozzles are made of U. S. Uscolite, the thermoplastic that resists corrosive acids.

Both Permobond and Uscolite are extremely versatile. Permobond can be bonded or applied to any fabricated metal section, no matter how big or complex. Uscolite piping is amazingly strong, yet lightweight and easy to handle. Both of these "U. S." products provide savings not only in operating costs, but in maintenance as well. Call on any of the 27 "U. S." District Sales Offices, or write to address below.

"U. S." Research perfects it . . . "U. S." Production builds it . . . U. S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

When inquiring check CP 6897 opposite last page

Practical Refractometry By Means of the Microscope

(Staff Review)

Users of Cargille's index of refraction liquids for microscopy and those who identify minerals and other solids microscopically will be interested in Roy M. Allen's paper-bound book. In 29 pages the author deals with determinations of refractive index, accuracy of the determination, the microscope, sources of lighting, and birefringement crystals. The remaining 30 pages are devoted to descriptions of the Allen refractive index sets, price lists, a bibliography, and an index.

To obtain "Practical Refractometry by Means of the Microscope" remit $1 direct to R. P. Cargille Laboratories, Inc., 117 Liberty St., New York 6, N. Y. When inquiring specify CP 6898 on handy form opposite last page.

Cellulose and Cellulose Derivatives Part I

Reviewed by E. E. DICKEY
The Institute of Paper Chemistry
Appleton, Wisconsin

This 509-page comprehensive monograph edited by Emil Ott, Harold M. Spurlin and Mildred W. Graffin is a revision and extension of the first edition published in 1943. Three parts, each in a separate volume, will eventually appear to replace the original single volume.

Part I is divided into five chapters which cover mainly the fundamental and classical knowledge about cellulose Chapter I (p. 1-8) by Ott and Tennent introduces the subject and sets up the scope of the treatise. Chapter II (p. 9-27) by Ward is a scholarly survey of the occurrence of cellulose. Chapter III (p. 29-215) by Purves, McBurney, Siu, Sookne, and Harris is a learned treatment of the chemical nature of cellulose and its derivatives. Chapter IV (p. 217-441) by Mark, Howsmon, Sisson, and Hock is a rigorous text on the structure and properties of cellulose fibers. Chapter V (p. 443-509) by Lewis, Ritter, Norman, and Brauns is an appropriate discussion of substances associated with cellulose in nature.

The architecture of the first edition has been changed considerably in planning the second edition so that theoretical and technical topics are more logically grouped. Even so, it seems awkward that tests for cellulose and cellulose derivatives have been displaced from the chapter on the chemistry of cellulose to Part III as a separate chapter. The symbols and nomenclature have generally been modernized, even though such terms as the confusing and ill-definable

"cellulosans" have been retained. The bibliographies are excellent; the typography is good. A serious omission is the absence of a subject index.

The critical and authoritative first edition readily established itself as the outstanding work devoted to the "scientific and technical information concerning cellulose and its derivatives". The second edition should easily continue this leadership.

To obtain "Cellulose and Cellulose Derivatives, Part I" remit $12.00 *direct to Inter-science Publishers, Inc.,* 250 *Fifth Ave., New York* 1, *N. Y. Specify CP* 6899 *opposite last page.*

Encyclopedia of Chemical Technology, Vol. XIII

(*Staff Review*)

The thirteenth volume of this monumental encyclopedia includes material from "Stilbite" to "Thermochemistry," in the same comprehensive, easy-to-read way as the preceding volumes.

Especially detailed is the coverage of stimulants and depressants, streptomyces antibiotics, styrene and its resins and plastics, sugars, sulfur and its related compounds, surface-active agents, tanning, tar, temperature measurement, terpenes, tetracyclines, textile fibers and technology, and thermochemistry.

To obtain "Encyclopedia of Chemical Technology, Vol. XIII" remit $30 ($25 *to subscribers*) *direct to Interscience Publishers, Inc., Dept. CP,* 250 *Fifth Ave., New York* 1, *N.Y. When inquiring specify CP* 6900 *on handy form opposite last page.*

Organic Reactions Vol VIII

(*Staff Review*)

Chemical procedures for catalytic hydrogenation of esters to alcohols, synthesis of ketones from acid halides and organometallic compounds, acylation of ketones, the Sommelet reaction, forming aldehydes from carboxylic acids, metallation with organolithium compounds, synthesis and reactions of β-lactones, and reaction of diazomethane and derivatives with aldehydes and ketones have been compiled in this latest volume of a most useful series for the organic chemist.

Limitations, interfering influences, effects of structure, and selection of techniques are discussed. Included in each section are detailed tables and an extensive bibliography.

To obtain "Organic Reactions, Vol. VIII remit $12 *direct to John Wiley & Sons, Inc., Dept. CP,* 440 *Fourth Ave., New York* 16, *N.Y. When inquiring specify CP* 6901 *on handy form opposite last page.*

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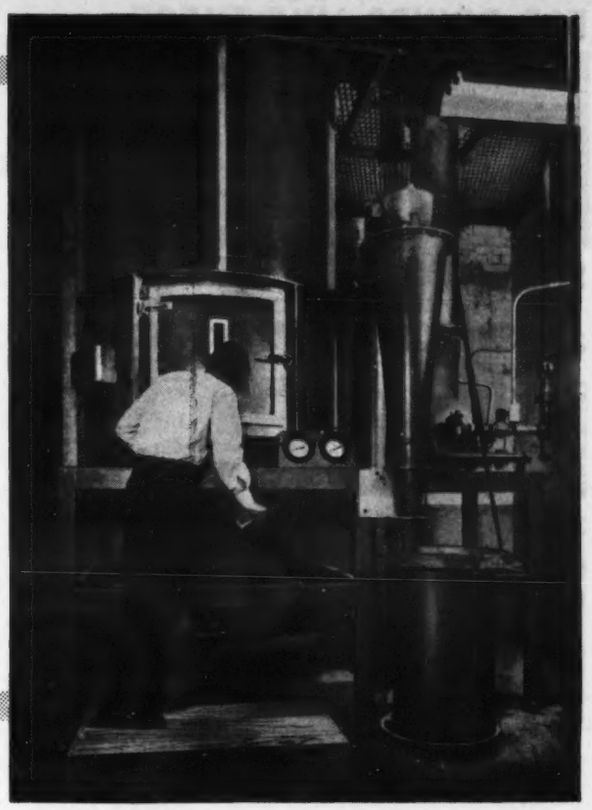

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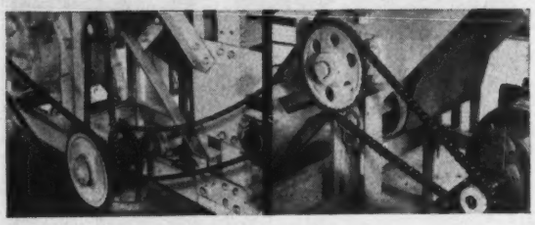

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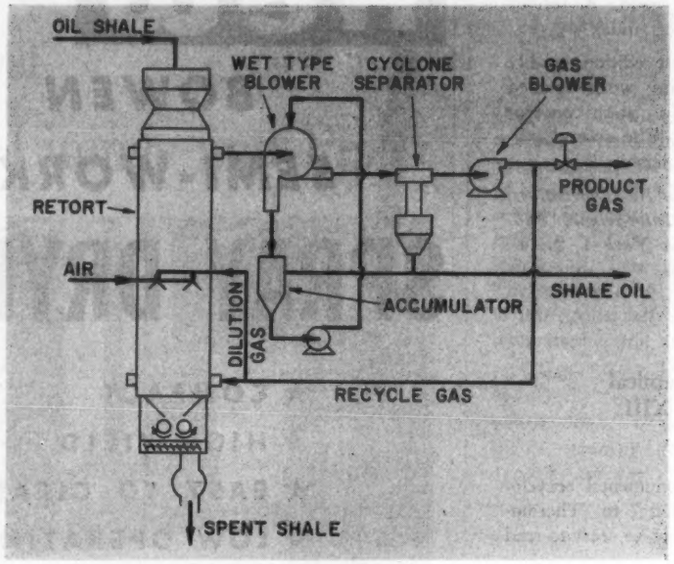
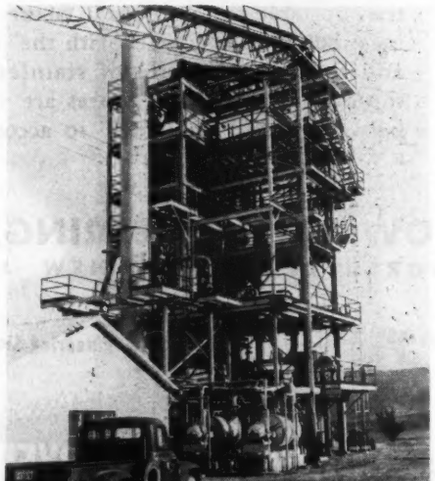


Shale is charged at top of retort, moves slowly down through preheating, retorting and combustion zones. Recycle gas, rising countercurrent to shale flow, first cools spent shale in lower part of retort then enters combustion zone where it is mixed with injected air. In retorting zone, oil is liberated as vapor. It condenses as tiny droplets in cooler zone near top, and is carried out in gas stream, from which it is recovered

Remotely-controlled proportioning system helps speed . . .

selection and weighing of raw shale at oil extraction plant

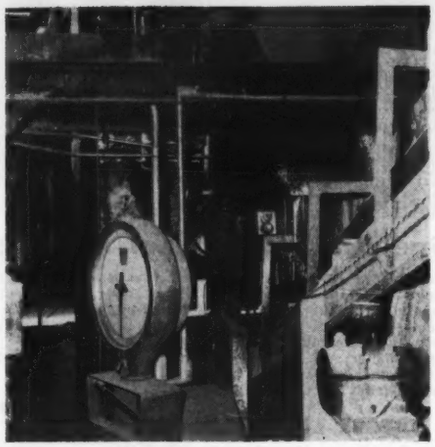


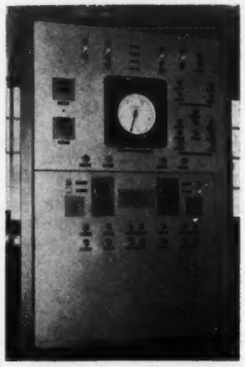
Retort where shale is pyrolyzed or burned by Bureau's Gas-Combustion process to yield 15 to 30 gal per ton of oil, plus product gas that is recycled to furnish fuel for the process

System is accurate and flexible, run by single operator — can be switched from automatic to manual at any time

WHOEVER ends up producing oil from shale, government or private industry, they're bound to profit from lessons learned at the U. S. Bureau of Mines' 150-ton-a-day engineering-scale experimental plant at Rifle, Colorado. At this installation oil is being extracted from shale by the Bureau's Gas-Combustion retorting process.

Shale for the retorting plant is mined from the Green River deposits of Colorado, Utah, and Wyoming. The shale is trucked from the mines, crushed into lumps from ¼ to 3″, and stored in bins at the experimental plant. Then this shale is pyrolyzed or burned in a retort and kerogen, its principle organic constituent, breaks down to yield oil, gas, and a residue containing carbon. The product gas is recycled to furnish fuel for heating the shale. Per ton, the shale yields from 15 to 30 gal of oil.





Shale from storage is conveyed automatically to this 500-lb-capacity scale. Weighed shale drops to surge hopper, and is fed to conveyor that takes it to top of retort

By setting dials on panel, single operator can control selection and weighing of raw shale for charging to retort

In this operation an automatic remote proportioning system is used to help maintain weighing accuracy and speed up movement of the soft slatey rock.

One operator runs proportioning system by setting dials on control panel to select amount and types of shale to be withdrawn from the storage bins and conveyed on belts to scale. Weight of each batch is indicated by a dial head, and an electric counter totals the number of weighings. Each operation can be followed by lights on the panel. Interlocks prevent operations from getting out of sequence. Also, operating control can be switched from automatic to manual at any time if required.

Remote panel for the proportioning system has two control circuits. Each can be used for any of four raw shale storage bins. After desired bins have been selected, two control dials are set to exact weight to be taken from each bin. Button is then pushed to start the scale cycle. Vibrating feeder under selected bin and proper belt in the remote scale house start simultaneously, and belt feeds raw shale into scale. Feeder and belt cut off at exact weight, and feed starts from another bin via vibrating feeder and belt associated with it. The scale empties into surge hopper and shale is with-

(*Continued on page* 115)

proven material handling power

with TORQUE CONVERTER DRIVES

6 "PAYLOADER" TRACTOR-SHOVELS

FRONT WHEEL DRIVE

MODEL HA—Completely new model—twice the digging, carrying and lifting capacity. Exclusive 40 degree bucket break-out at ground level. Digs, carries, dumps and spreads bulk materials—indoors and outdoors. Unloads box cars of bulk materials. 18 cu. ft. bucket capacity.

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MODEL HFC—This "PAYLOADER" with 1 cu. yd. bucket capacity is a popular, well-proven model especially for outdoor use. Rear-wheel-drive enables it to dig and grade as well as load trucks, carry and stockpile. Travel speeds up to 19 m.p.h.

MODEL HFHC—This extra high-lift "PAYLOADER" can dump its loads over bin edges up to 11½ feet high. Especially popular for loading and handling coal and other light materials into high trucks and wherever high lift and long reach are desirable.

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3 "PAYLOADER" TRACTORS

MODEL TM — A big, 4-wheel-drive tractor with 15,000 lbs. drawbar pull. Has effective traction to work on pavement, snow, sand and mud. Used for switching and spotting cars—walks easily across tracks. Can be equipped with railroad couplers, air brake control, etc.

MODEL TU-90 — Another 4-wheel-drive tractor with power steer. Pushes or pulls in either direction. Only 5 feet high; 12 feet long. Will handle large aircraft easily — has 9,000 lbs. drawbar pull.

MODEL TC-60 — A powerful, compact tractor with 6,000 lbs. drawbar pull, yet less than 10 feet long. Rear wheel drive on dual tires; front-wheel power-steer; speeds up to 17 mph.

Full-reversing transmissions plus torque converter drive feature all these famous "PAYLOADER" tractor-shovels and tractors — give them maneuvering speed, ease of control and a wide choice of operating ranges.

Each "PAYLOADER" is a proven unit, made by the tractor-shovel pioneer that has built more wheeled tractor-shovels than all others combined. And "PAYLOADER" units are sold by an experienced, well-established Distributor organization having complete parts and service facilities that protect your "PAYLOADER" investment.

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Robinson Air Activated Conveyor

The ***Low-volume*** *Air Conveyor*

▶ Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

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When inquiring check CP 6905 opposite last page

MATERIAL HANDLING

Tractor train operates without driver . . .

moves through plant following overhead guide wire

Neither operator nor physical connection is required for operation of tractor train. Radio waves that control truck are transmitted over wires by means of signal boxes installed throughout plant. "Sniffer" box mounted on truck picks up waves from guide wire overhead. To call a truck, button is pushed and truck moves immediately to station from which signal originated.

Guide wire is easily strung from ceiling along desired routes and into bays, stockrooms and shipping rooms. Wire may also be laid in slot in floor.

(Guide-O-Matic truck is product of Barrett-Cravens Co., Dept. CP, 628 Dundee Rd., Northbrook, Ill. . . . or for more information check CP 6906 on handy form opposite last page.)

Teflon-ceramic seal broadens use of pump . . .

slurry of diatomaceous earth handled satisfactorily

Availability of a Teflon-ceramic seal on Type 20 stainless centrifugal pump broadens its field of application in handling corrosive liquids and slurries. In a test in which the seal was used, a slurry of diatomaceous earth was pumped continuously for more than 20 weeks, with the seal remaining in good condition. Proximity to the suction port keeps gland under reduced pressure and serves to keep foreign matter from working into seal.

(Type 20 stainless pump with Teflon ceramic seal is product of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N. J. . . . or for more information about manufacturer's product check CP 6907 on handy form opposite last page.)

Speeds unloading of box cars

This Jaeger Auto-Scoop is working as a car unloader at American Cyanamid Company's Piney River, Virginia plant, handling sulphur and/or copperas. Designed to work in cramped quarters, it's ideal for this and other jobs. The Auto-Scoop moves a bigger load, turns shorter, carries faster, can dump higher and farther than comparable 12 cu. ft. loaders. Many other advantages that bring production gains, cut costs. Write for Catalog L12-4.

JAEGER LOAD-PLUS *auto-scoop*

12 cu. ft.

Low bucket tilt-back assists full-bucket loading, permits carrying as low as 4½" from ground.

5" shorter turning radius (6'6"). Faster speeds to 13.88 mph in reverse, 7.66 forward.

Higher clearance (6'8"), more reach (2'7").

1 cu. yd. Load-Plus available for bigger work.

THE JAEGER MACHINE CO., 616 Dublin Ave., Columbus 16, Ohio

When inquiring check CP 6908 opposite last page

MORSE DeLUXE 500 Portable ROTATOR

- ***MIXES***
- ***BLENDS***
- ***TUMBLES***
- ***CLEANSES***

Faster and at less cost!

The patented Morse De Luxe 500 Rotator will handle 1 to 55 gal. containers, weighing to 500 lb. They revolve safely, smoothly, efficiently at 10, 20, 40 rpm on this powerful, compact, portable, motorized unit. Cuts cost of mixing, blending, tumbling, cleansing. Easily moved and loaded by one man. Has ¾" dia. power driveshaft with self-aligning ball bearings. Four adjustable 4" dia. Neoprene-tread drive wheels. Fully enclosed worm-gear drive with 30-1, 15-1, 7½-1 reductions. Weighs 137 lb. Delivered complete with motor, drive mechanism and tipping lever. Write for Bul. #1053 and catalog, showing full Morse line of Drum and Barrel handling equipment.

MORSE *MANUFACTURING CO. INC*

757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 6909 opposite last page

SHALE HANDLING

(*Continued from page* 113)

drawn continuously by a vibrating feeder that empties onto belt conveyor, moving to retort.

Progress of the weighing can be watched on a follower dial on the control panel. Lights show exactly what operation is being performed. When the total load is accumulated, the scale dumps to the surge hopper, checks itself for zero-tare position, then repeats the cycle as often as wanted. Changing from one bin to another takes only seconds.

Interlocks automatically check zero-empty position of the scale, overload indication, wrong sequence or wrong setting of the dials. A signal sounds to warn operator if anything is amiss, and red lights show which control section is affected.

Shale throughput for this engineering plant is 150 tons per day. However, the plant has been designed so that it can operate at twice that rate. Design is highly flexible to facilitate investigation of process variables.

Yield of oil by Bureau's extraction process is about 10 or 12% by weight or 90-95% of Fischer assay. The product is heavy oil (about 20° A.P.I.), and has a pour point of about 90°F. Its sulfur content is moderate (0.7% by weight), but it is very high (more than 2% by weight) in organic nitrogen.

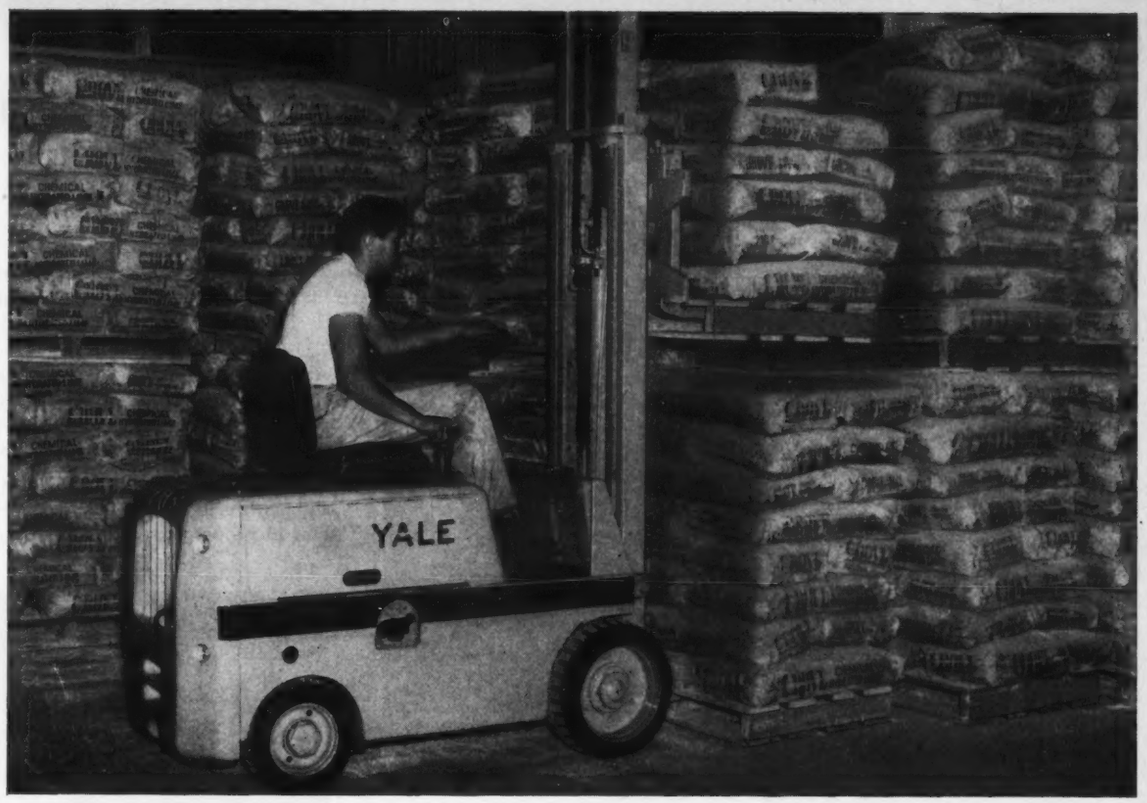
Shale grade is important. Shale with assay values much above 30 gal of oil per ton tends to coke and clinker more than shale assaying lower. Feed to retort is sampled continuously and samples are analyzed for oil content by the Fischer assay method. Mineral carbon dioxide content is also determined, and a breakdown of particle size distribution is made by screening. Thus feed materials of various grades and particle size ranges can be fed separately, or simultaneously.

(Select-O-Weigh system is a product of Richardson Scale Company, Dept. CP, Van Houten Ave., Clifton, N. J. . . . check CP 6910 opposite last page.)

Straightens out confusion about automation language

Simplified booklet is intended as guide to those non-engineers who have come up against the technical terms of automation. This dictionary of words and phrases makes automation concepts clear. It was designed with an eye to enlightening those whose technical knowledge is limited to fuse changing or setting thermostats.

Dictionary is available from Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 6911 opposite last page.



Yale Trucks speed lime from storage to reaction vats

THROUGHOUT CHEMICAL PLANTS YALE TRUCKS PROVIDE FAST, SAFE HANDLING

The new YALE G-52 Gas Truck picks up pallet loads of bagged lime, moves them quickly, smoothly, safely to processing area. Controls are at operator's finger tips... he gets joltless starts, jarless stops from smooth YALE Fluid Coupling. Other YALE Gas Trucks—and YALE Electric and Diesel Trucks and use-extending attachments—solve every sort of handling problem for chemical processing plants. No matter what the size of load... the type of load... the handling duty cycle, there's a YALE Truck that will fill your exact need—in receiving, storage, processing, maintenance, shipping. Why not get the facts now on the complete YALE line?

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FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

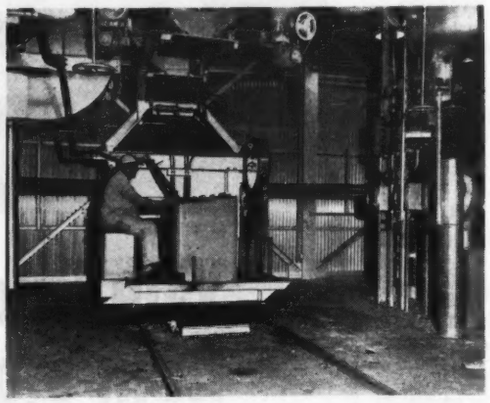
SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

Three tons of material handled by self-propelled weigh larry

unit travels on 48" gage track at speeds of 50 ft per minute

At the cathode paste plant of Kaiser Aluminum and Chemical Corporation's aluminum reduction plant, Chalmette, Louisiana, a self-propelled weigh larry is speeding material handling operations.

In operation, the larry draws down petroleum coke and anthracite coal from four overhead fraction bins in proper proportions by weight and delivers



Self-propelled weigh larry loads and discharges full load of 6000 lbs in twelve minutes

the aggregate by bottom dump directly to mixers one floor below. At present it is equipped to handle dry materials only. Maximum size particles now being handled are minus ½". Larry is equipped with a four-dial cumulative scale which shows both individual weigh of each draw and total weight in hopper. Maximum capacity is 6000 lb.

Larry operates over a 30' 48" gage track and is self-propelled by a 3.2 hp air motor. Normal operating speed is 50 fpm loaded.

Control system is combination pneumatic-electric. Console on the larry contains all indicator lights and operating controls. Air at 90 psig and power at 60 cycle, single phase 110 volts is provided to larry through a pantograph arrangement of multi-circuit cable and pipes.

Forty-eight circuit electrical system is interlocked to insure proper sequence of loading and discharging. Larry can be set to load any predetermined amount of material in any sequence. Total sequence time to load and discharge is now 12 minutes maximum for a full load.

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Although this larry is a custom installation, design can be readily modified to meet other requirements in power and control, materials to be handled, or number of drawdowns.

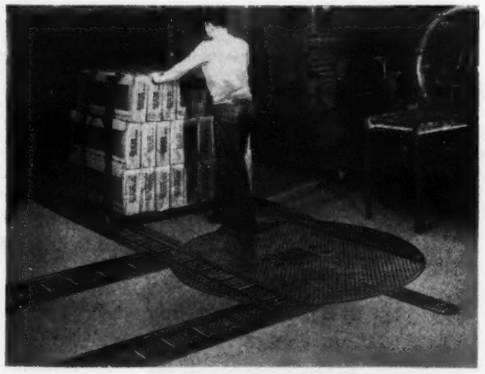
(Weigh Larry was designed and built by Kaiser Engineers, Division of Henry J. Kaiser Co., Dept. CP, Kaiser Bldg., Oakland, Calif. . . . or for more information reader may simply check CP 6913 on the convenient Reader Service slip which is located opposite last page.)

Heavy pallets and skids moved by one man without truck . . .

use of double trackage system eliminates waiting for fork truck to move loads

Uses: To move heavily-loaded skids from machine to machine or along assembly lines. Trackage can be installed into loading docks, bridges, scales, elevators, etc.

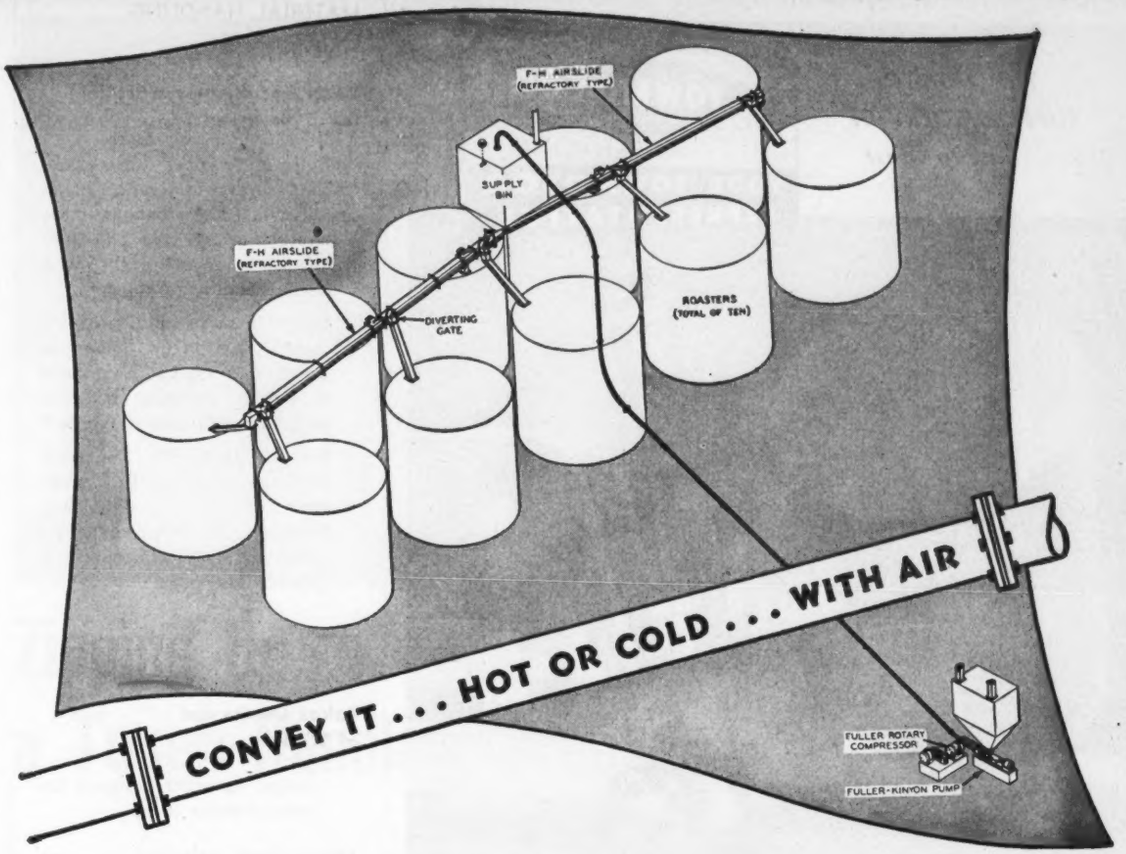
Features: Trackage is placed flush in floor with tops of rollers just above heavy steel safety treads. Foot and truck traffic can cross at any point.



Trackage system allows one man to move heavily-loaded skid. Turntable in foreground is used to change direction of skid

Description: Rolling function of system is performed by trackage which consists of a series of rollers containing easy-running sealed ball bearings. Load is carried on special flat-bottomed dolly which glides easily over track rollers when pushed by one man. Skid bridges two parallel rows of trackage. Legs of skids are actually runners, one on each side, which slide over rollers of the trackage. Turntables are used to change direction.

(Epco Double Trackage System is a development of Engineering Products Co., Inc., Dept. CP, 122 S. Michigan Ave., Chicago 3, Ill. . . . or for more information reader may simply check CP 6914 on the convenient Reader Service slip which is located opposite last page.)


F-H AIRSLIDE (REFRACTORY TYPE)
SUPPLY BIN
F-H AIRSLIDE (REFRACTORY TYPE)
DIVERTING GATE
ROASTERS (TOTAL OF TEN)
CONVEY IT . . . HOT OR COLD . . . WITH AIR
FULLER ROTARY COMPRESSOR
FULLER-KINYON PUMP

Noranda Mines handles hot flue dust with Fuller-Kinyon Pump and F-H Airslides

The problem of conveying many dry, pulverized materials, heretofore considered impossible and impractical from an ecomomic standpoint, is now being solved by the use of air through dust-tight, contamination-proof pipe lines. Be the material hot or cold, Fuller-Kinyon Conveying Systems and F-H Airslides, either individually or in combination, have proved their worth in many industrial plants.

The drawing above illustrates how Noranda Mines solved its problem of handling hot flue dust in a highly satisfactory and profitable manner. The Fuller-Kinyon Pump, lower right of drawing, conveys at rate of 25 tons an hour, from a precipitator collecting hopper to a supply bin above ten roasters. From the supply bin the material is discharged to F-H Airslides, which convey and distribute uniformly to the roasters. And, this is accomplished with no dust or loss of material. Flue dust has a temperature up to 800 deg. fahr.

A Fuller Rotary Single-stage Compressor furnishes approximately 478 c.f.m. of air at 15-lb. pressure, to the Fuller-Kinyon Pump, through a direct-connected air line. Air, where and when needed, to do the work required in a highly satisfactory and economical manner.

When your problem is conveying dry, pulverized materials, why not consult us. A Fuller engineer will be glad to make a study of your layout and, if feasible and warranted, make suggestions for the betterment of your operation.

We will gladly send you our eight-page Bulletin G-1, illustrating and describing the four air-conveying systems designed and built by us. Write for it now.

VISIT BOOTH 1971
NATIONAL MATERIALS HANDLING EXPOSITION
CHICAGO, MAY 16-20

FULLER COMPANY—CATASAUQUA, PA.
Branch offices
Chicago—San Francisco—Los Angeles—Seattle—Birmingham

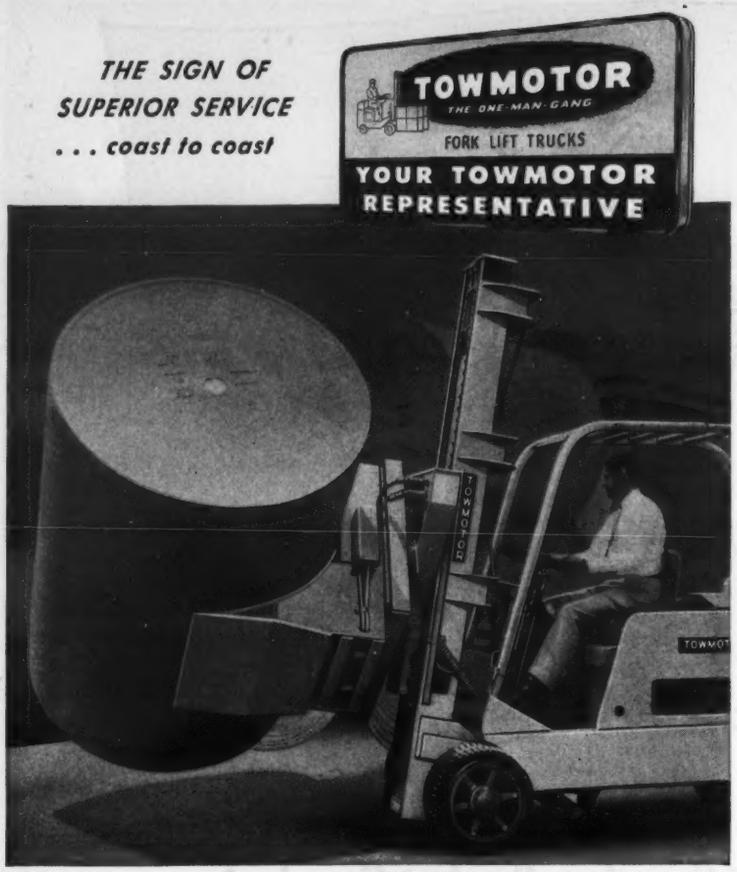
Fuller
. . . . pioneers in harnessing AIR

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS . . . .
PREHEATERS . . . . COMPRESSORS AND VACUUM PUMPS . . .
FEEDERS AND ASSOCIATED EQUIPMENT

G-100
1171

When inquiring check CP 6915 opposite last page

THE SIGN OF SUPERIOR SERVICE
. . . coast to coast



New TOWMOTOR Roll Clamp upending multi-ton paper roll

FAST DEPENDABLE SERVICE
when you need it!

Every Towmotor fork lift truck is designed to stay on the job longer. However, abuse, or years of service eventually make repairs necessary. That is when Towmotor's easy service accessibility pays off. Each Towmotor Representative is a materials handling specialist who backs up the Towmotors he sells with the most efficient and complete service facilities in the field. Talk to him about the advantages of Towmotor 3-way Service. See your Towmotor Representative today, and write for complete service information. TOWMOTOR CORPORATION, DIV. 2305 1226 E. 152nd St., Cleveland 10, Ohio.

FOR SUPERIOR SERVICE
CALL YOUR LOCAL TOWMOTOR REPRESENTATIVE

TOWMOTOR FORK LIFT TRUCKS AND TRACTORS SINCE 1919

When inquiring check CP 6916 opposite last page

Describes scraper storage for bulk chemicals

Bulletin describes storage machines in use in a variety of installations and contains many layout drawings and photos of interest to anyone with a materials handling problem.

Basic chemicals and corrosion are discussed briefly. Equipment described is especially designed to handle corrosive materials with the minimum of contact.

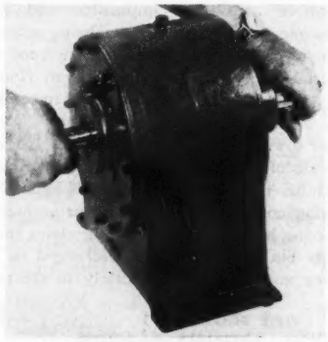
Booklet MMM No. 2 is available from Sauerman Bros., Inc., Dept. CP, 620 S. 28th Ave., Bellwood, Ill. When inquiring specify CP 6917 on handy form opposite last page.

Takes shocks out of stops . . .

torque converter designed for motors under 10 hp

Fluid torque multiplier for gasoline or electric motors under 10 hp eliminates shock of starting or stopping.

It allows engines to assume full speed and hp regardless of the



Torque converter for small motors

load. Used with a multiple bank of electric motors, unit eliminates need for synchronization.

(Fluomatic is a product of Little Beaver Industries, Dept. CP, Willoughby, Ohio. . . . or for more information check CP 6918 on handy form opposite last page.)

THE Thayer SCALE

AUTOWEIGHTION
BATCHING • FILLING • CHECKING
AUTOMATICALLY BY WEIGHT
COMPLETE SYSTEMS ENGINEERED AND PRODUCED
WE CAN SOLVE YOUR INDUSTRIAL WEIGHING PROBLEMS WITH AUTOMATIC, SHOCKPROOF THAYER-PLATE SCALES. INQUIRE ABOUT FREE ENGINEERING SURVEY
THAYER SCALE & ENGINEERING CORP., ROCKLAND, MASS.

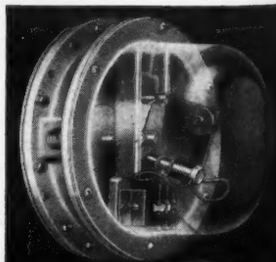
When inquiring check CP 6919 opposite last page

BIN-FLO AERATING UNIT

Provides Steady Flow of Dry, Finely Ground Materials which tend to bridge in storage. Uses only small amount low-pressure air.

BIN-DICATOR BIN LEVEL INDICATOR

For All Bulk Materials



signals change in level; automatically starts and stops filling and emptying equipment.

THE BIN-DICATOR CO.
13946-D Kercheval • Detroit 15, Mich.

NEW DETAIL DATA BOOK FREE

When inquiring check CP 6920 opposite last page

Flexibility in material handling provided by portable unit

Uses: To elevate or lower boxes, cartons, sacks, or other commodities from dock to truck or from floor to stack. Can also be integrated with system of portable roller or wheel conveyors.

Features: Units are available with adjustable wheel support on drive end and pad support on other end.

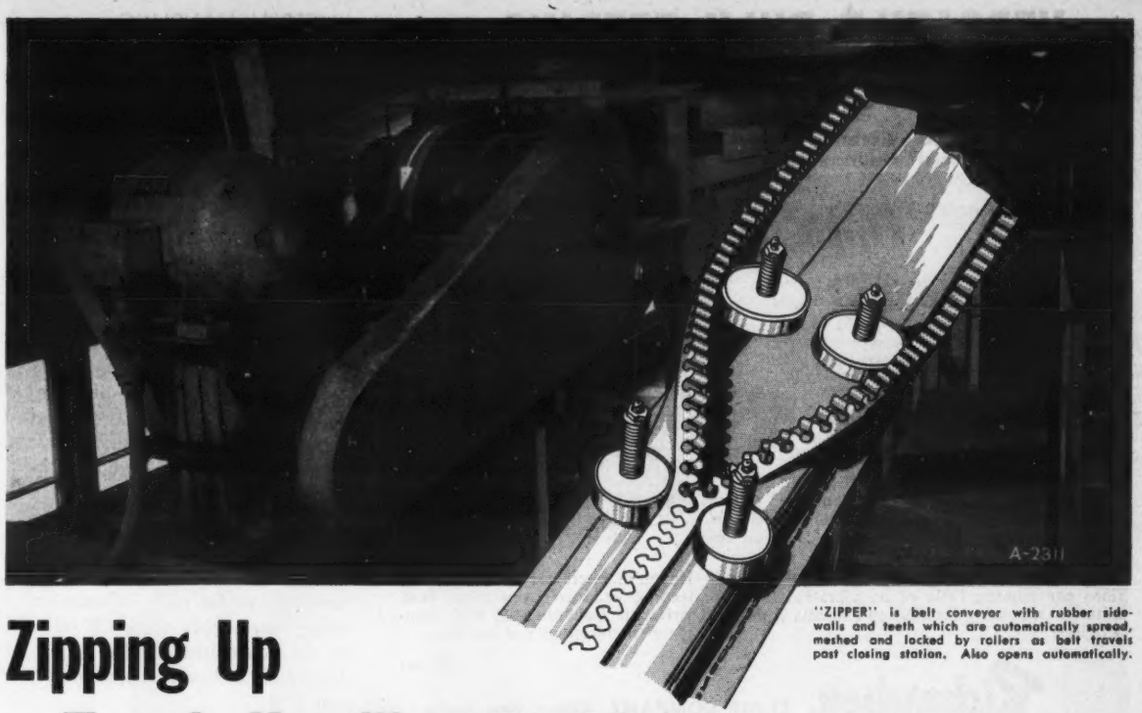
Description: Standardized lengths of 5½, 8, 10, 13, and 15 ft are fabricated by manufacturer

Portable belt conveyor provides mobile handling

in belt widths of 10, 14, 16, 20, and 24 inches. Standardized units are all steel construction, but on lightweight applications, sub-assemblies can be fabricated of high-strength aluminum.

(Conveyors are product of Standard Conveyor Co., Dept. CP, North St. Paul, Minn. . . . or check CP 6921 opposite last page.)

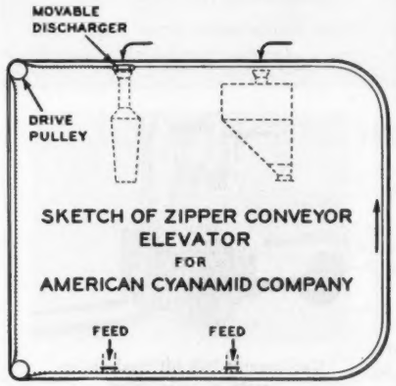
"I told ya and told ya: Don't race around the loading dock!"



"ZIPPER" is belt conveyor with rubber sidewalls and teeth which are automatically spread, meshed and locked by rollers as belt travels past closing station. Also opens automatically.

Zipping Up a Tough Handling Problem

S-A "Zipper" Conveyor-Elevator for Ammonium Chloride Ends Corrosion Troubles . . . .



For a long time, handling of ammonium chloride had been a difficult and expensive operation for American Cyanamid Company at its Bound Brook, New Jersey plant.

Because ammonium chloride has a very corrosive effect upon ferrous metal, dust escaping during handling could cause serious damage. At the same time, ordinary enclosed conveying systems were similarly subject to corrosion troubles. An S-A "ZIPPER" Conveyor-Elevator provided the economical answer.

Since the "ZIPPER" Conveyor-Elevator is made of rubber it is immune to corrosion and because it zips closed like a conventional slide fastener, corrosive dust cannot escape. The ammonium chloride actually travels through a sealed rubber "pipe line" that moves with the load. The ammonium chloride is fed to the S-A "ZIPPER" at two points. It is lifted in the sealed "ZIPPER" and carried to storage. Here a movable discharger, spotted by a hand winch, discharges the belt by gravity into either of two bins. At both feed and discharge, the only points in the "ZIPPER" system where the ammonium chloride comes into contact with metal, stainless steel chutes and supporting rollers are used. Corrosion problems have been practically eliminated.

If you have a bulk handling problem where corrosion, degradation, dust or economical adaptation to limited space or plant layout is a consideration, see what an S-A "ZIPPER" Conveyor-Elevator system offers you. Write and we'll arrange a survey—or send for Bulletin No. 349.

STEPHENS-ADAMSON MFG. CO.

11 Ridgeway Avenue, Aurora, Illinois • Los Angeles, Calif. • Belleville, Ontario

Engineering Division
Specialists in the design and manufacture of all types of bulk materials conveying systems.

Standard Products Division
A complete line of conveyor accessories including centrifugal loaders—car pullers—bin level controls—etc.

Sealmaster Division
A complete line of industrial ball bearing units available in both standard and special housings.

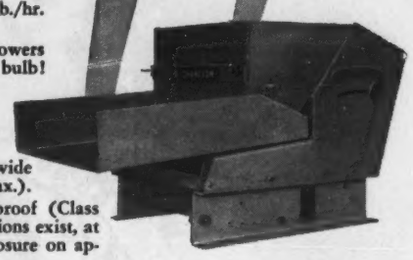
When inquiring check CP 6922 opposite last page

VERSATILE BULK FEEDING...

from a *trickle* to a *torrent* with VELOFEEDER

A mechanical vibrating feeder especially designed for free-flowing chemicals, fertilizer, pellets and similar materials at lower cost, higher efficiency.

Here's Why!



Higher Output—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

Lower Power Needs—⅛ hp. motor powers unit—inexpensive as a 100-watt light bulb!

Smaller Space Needs—35 inches long, 17½ inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

Easier Control—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

Safer Operation—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure on application.

Less Vibration—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).

If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.

1092

Richardson SCALE COMPANY, Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Detroit • Houston • Memphis • Minneapolis
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan

MATERIALS HANDLING BY WEIGHT SINCE 1902

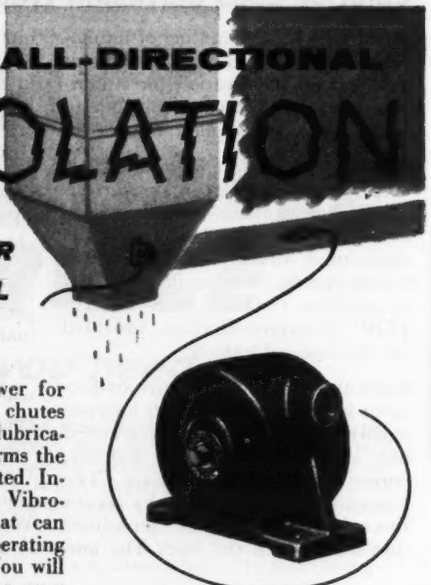
When inquiring check CP 6923 opposite last page

EFFECTIVE, ALL-DIRECTIONAL

VIBROLATION

MOVES GRANULAR OR WET MATERIAL NOISELESSLY

The simplest, most quiet answer for moving materials in hoppers, chutes and bins. One moving part, no lubrication, no maintenance, never harms the equipment on which it is mounted. Instantly self-starting every time. Vibrolator is the only vibrator that can guarantee this regardless of operating conditions. Write for catalog. You will also receive form for describing your problem. No obligation!



VIBROLATORS®

®Vibrolator is a registered trade name and applies only to the patented Peterson Vibrolator.

MARTIN ENGINEERING COMPANY

155 KEMP ST. NEPONSET, ILL.

When inquiring check CP 6924 opposite last page

MATERIAL HANDLING

Stacks 12 100-lb bags on pallet in minute

Pallet-loading machine uses suction pick-up principle to automatically stack variety of units on pallets.

Machine is fed from conveyor line and pattern laying is pushbutton controlled by operator.

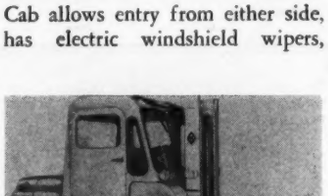
In palletizing multi-wall bags, machine will handle 12 one hundred pound bags per minute, discharging them onto either of two pallet stations. Machine is suitable for unloading pallets and feeding packages onto conveyor line.

(Pallet loader is a product of Alvey Conveyor Mfg. Co., Dept. CP, 9308 Olive St., St. Louis 24, Missouri . . . or for more information reader may simply check CP 6925 on the convenient Reader Service slip which is located opposite last page.)

Protects drivers in bad weather

All-weather cab has been developed for Models FTP60-24 (gasoline) and FTPD60-24 (diesel) 6000-lb capacity Buda fork lift trucks.

Cab allows entry from either side, has electric windshield wipers,

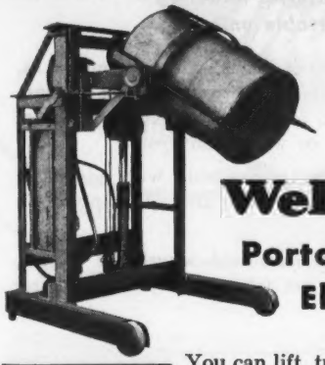


Cab permits fork lift truck to operate all year round

tinted plexiglass overhead window and safety glass throughout. Heaters and defrosters are available as optional equipment.

(Cab is a product of the Buda Co., Div. of Allis-Chalmers Mfg. Co., Dept. CP, Harvey, Ill. . . . or for more information check CP 6926 on handy form opposite last page.)

Simplify, Speed Up DRUM HANDLING



with New

Weld-Bilt Portable Drum Elevator

"Weld-Bilt" PRODUCTS

You can lift, transport, store and DUMP all sizes of drums faster, easier, with this new WELD-BILT Portable Drum Elevator. Unique worm-gear tilting mechanism makes "last-drop" dumping safer, more efficient, with minimum effort. Lift, electric-hydraulic operated, is also available for hand operation or fully electrified. Jack-up type steering permits easy, safe positioning.

Write for prices on this important time and labor-saver.

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
322 Water Street, West Bend, Wisconsin

When inquiring check CP 6927 opposite last page

● Catalog also covers induction Relays, Relay Enclosures, Contactors and Starters, Multiple Pump Controls, Electrode Holders, Starter and Relay Combinations, Special Controls and Panels.

B/W CONTROLLER CORPORATION
2204 E. Maple Road
Birmingham, Mich.

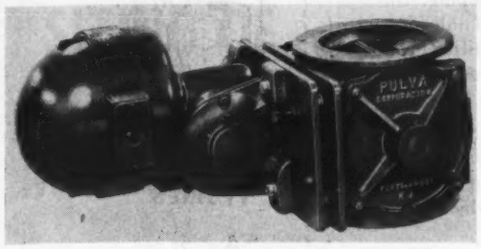
FIRST and FOREMOST IN THE FLOATLESS CONTROL FIELD

2

When inquiring check CP 6928 opposite last page

Feeder features 8-vaned rotor, spring-loaded wiper blades to keep tight seal . . .

replaceable blades can be supplied in materials to suit application



Eight-vaned rotor gives rotary feeder good sealing qualities

Uses: For continuously discharging cyclones, dust collectors, hoppers, continuous dryers, conveyor feed or discharge, and pulverizer discharge.

Features: Unit uses an eight-vaned rotor which puts at least two vanes in contact with valve body at all times. This, together with spring-loaded replaceable wiper blades makes the valve a good rotary air lock.

Description: Rotary valve's wiper blades are made of a cloth-laminated plastic. Wiper blades are also available in brass, copper, Teflon, nylon, etc. Sizes now manufactured are 4, 6, and 8 inches.

(Pulvalve is a product of Pulva Corp., Dept. CP, 555 High St., Perth Amboy, N. J. . . . or for more information reader may simply check CP 6929 on the convenient Reader Service slip which is located opposite last page.)

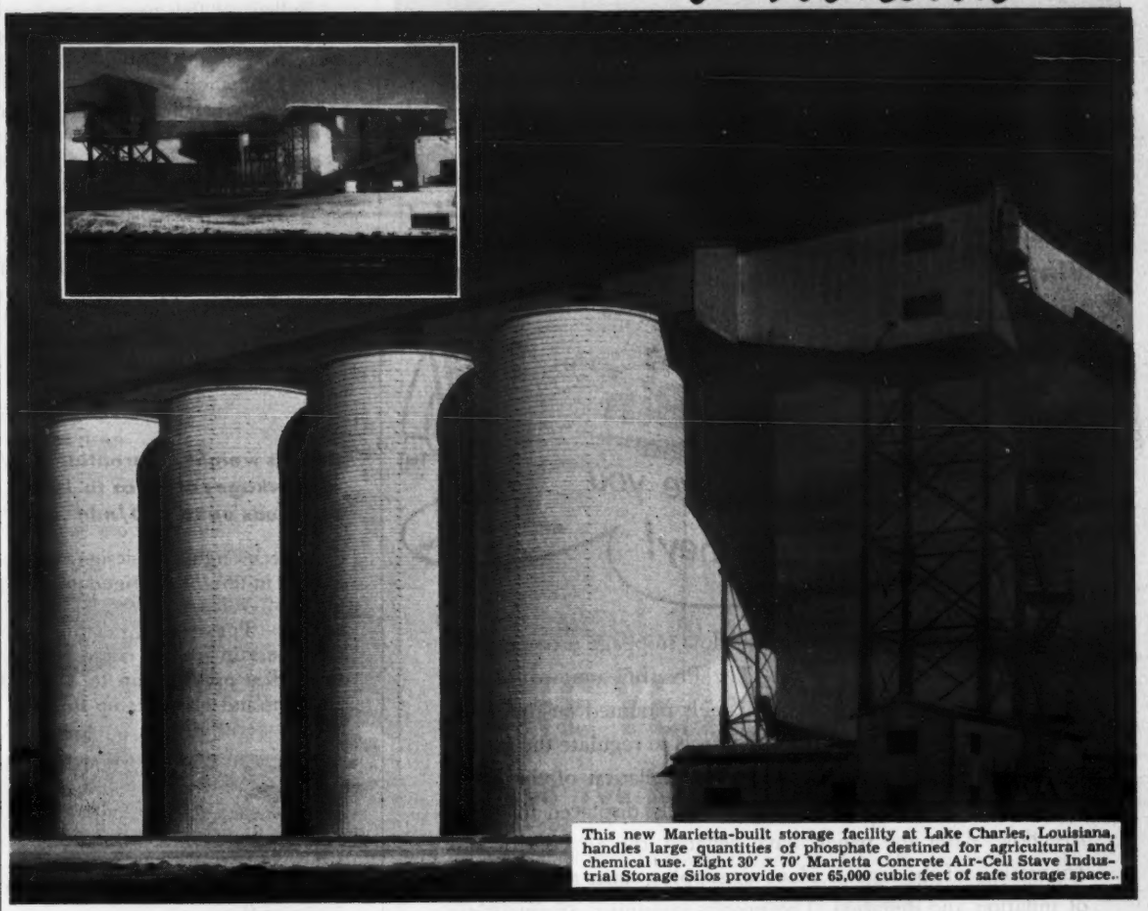
Describes advantages and uses of lightweight trucks

Data file describes weight, flexibility and caster advantages of lightweight industrial trucks. Features described are the torsionally flexible construction and lifetime lubricated casters of these aluminum trucks.

Also included are specifications for various sizes and styles of flat bed, multiple deck and A-frame trucks in the line as well as information on removable sizes, ends, and other accessories.

Industrial Truck Data File is issued by Magnesium Company of America, Tobey Aluminum Div., Dept. CP, East Chicago, Indiana. When inquiring reader may simply specify CP 6930 on the convenient Reader Service Slip which is located opposite last page.

protect your production . . . with Marietta



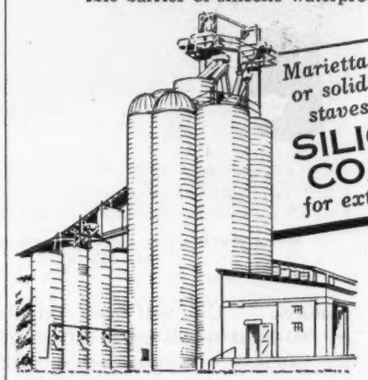
This new Marietta-built storage facility at Lake Charles, Louisiana, handles large quantities of phosphate destined for agricultural and chemical use. Eight 30' x 70' Marietta Concrete Air-Cell Stave Industrial Storage Silos provide over 65,000 cubic feet of safe storage space.

CONCRETE INDUSTRIAL STORAGE SILOS

Give valuable materials the protection they deserve in moisture-free, fire-safe, adaptable Marietta Concrete Stave Silo Storage Systems.

Even hurricane-whipped rains cannot penetrate the walls of Marietta storage installations . . . an invisible barrier of silicone waterproofing effectively seals pores in the concrete exterior coating . . . eliminating formation of destructive efflorescence and reducing weathering and spalling. In addition to effectively lengthening the life of exterior finish coating, silicone treatment prevents ugly staining by soot or chemical dusts.

Marietta Concrete Storage Systems are designed by experts in industrial materials handling. Your operations can benefit from Marietta's wide experience . . . write or wire today . . . you'll be pleasantly surprised to find how economically these cost-cutting, efficient storage systems can be supplied . . . yet "tailored" to your own specific needs! Send for your copy of our silo storage catalog.



Marietta, Air-Cell or solid concrete staves may be SILICONE COATED for extra long life

Precast Concrete Products for Farm, Home and Industry

THE Marietta CONCRETE CORPORATION Marietta, Ohio

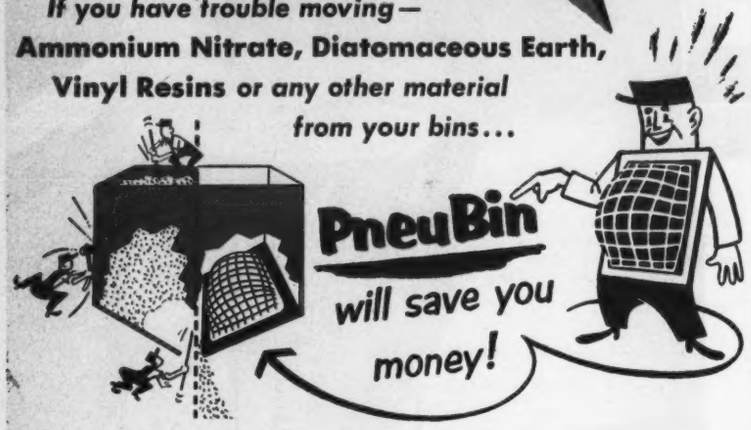
BRANCH OFFICES: 501 Fifth Ave., New York 17, N. Y.; Pulaski Hwy. at Race Rd., Baltimore 21, Md.; 411 Foster St., Nashville, Tenn.; Box 5192, Charlotte 6, N. C.; Hollywood, Fla.; Box 592, Jamestown, N. Y. REPRESENTATIVES in principal cities.

When inquiring check CP 6931 opposite last page

PULSATING PANELS

eliminate flow stoppage in bins!

If you have trouble moving—
Ammonium Nitrate, Diatomaceous Earth, Vinyl Resins ***or any other material from your bins...***



PneuBin will solve your flow stoppage problems and reduce your operating expense. The PneuBin unit consists of steel-backed, neoprene, pulsating panels mounted on the inside wall of your present bins and air controls to regulate the panels' action. By the pneumatic inflation and deflation of the PneuBin panels, the bin contents are positively displaced to insure free flow. After the panels have deflated, the air control unit (operating off the regular plant air supply) starts another cycle of inflation and deflation. The process continues *automatically* at whatever frequency is set on the air controller (this frequency is adjustable).

How PneuBin Saves Money

PneuBin decreases plant operating costs by reducing maintenance, insures constant material flow to production lines and greatly increases personnel efficiency through its quiet operation.

Send for "Flow Stoppage Report" and FREE Literature

PneuBin engineers will gladly make recommendations with no obligation on your part.

PneuBin

A PRODUCT OF
GEROTOR MAY CORPORATION
1527 Maryland Ave., Baltimore 3, Maryland

When inquiring check CP 6932 opposite last page

Data sheet describes method of handling fly ash

Bulletin of four pages covers application of steam jet pneumatic ash handling systems to small steam boiler plants. Descriptive information is included on bottom ash hoppers, ash gates, fly ash hoppers, materials handling valves, transport piping, collectors, vacuum breaker valves, silos and unloaders, etc. Line and schematic drawings illustrate conveying of boiler bottom ash and fly ash in dry state to temporary storage silos.

Data sheet Za is available from Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. When inquiring specify CP 6933 on handy Reader Service slip which is located opposite last page.

Detects weight differential of 1/60 oz for packages of 1/4 oz to 10 lb at speeds up to 130/min . . .

checkweigher is designed to be incorporated as in-line of continuous packaging line

Uses: For in-line weighing of packages and containers in weight range from 1/4 oz to 10 lb. It handles packages up to 4½ x 7-¾" base size and cans and glass jars up to 5-⅛" in diameter.

In-line checkweigher detects variations in weight of 1/60 oz

Features: Unit will detect weight differential of ±1/60 oz at speeds up to 130 per minute. Cartons are handled with pusher-type loader; cans and jars by worm-type loader.

What's "A New Solution"?

It's an article in CHEMICAL PROCESSING describing a new way of solving a tough plant operating problem.

In each issue you will find specific "case histories" showing how these processing problems were solved.

Each article
. . . states the operating problem
. . . explains the process used
. . . gives details of how problem was solved
. . . shows results secured.

Take a look at "New Solutions" articles in this issue—they might suggest a "solution" for some of your tough processing problems.

DO YOU REQUIRE ACCURATE SIZING OF GRANULAR MATERIALS?

If you process granular materials that must be uniform in length, width, or thickness, Hart-Carter sizing machinery may be what you need.

Hart-Carter makes several types of equipment that accurately sizes or separates by means of pocketed Carter discs or indented Hart cylinders . . . or by cylinders perforated with either slots or recessed round holes. These principles and methods are described in folders CPG-2 and L-1, which we'll be glad to send to you.

Information you supply our technicians about the in-put materials to be sized, and the "product" specifications, will enable them to make sound recommendations. (Such information will be kept confidential, of course.) Tests in the Hart-Carter Laboratory are free.

Write today for folders CPG-2 and L-1

HART-CARTER COMPANY

677 19th Avenue N. E.
MINNEAPOLIS 18, MINNESOTA

Since 1919 . . .
Engineers and Manufacturers of Machinery for Separating and Sizing Granular Materials

When inquiring check CP 6934 opposite last page

Description: During weighing operation container rests on bars — reducing possibility of product accumulation having detrimental effect on scale accuracy. Scales can be adjusted by simply moving weight on scale beam. After weighing, container is rapidly moved to segregation lines. Correctly filled containers pass directly to next machine. Over or underweights are by-passed automatically by deflector fingers to parallel conveyors for reprocessing. Two or three way segregation is possible depending on requirements.

(Model CWA checkweigher is product of Bartelt Engineering Co., Dept. CP, Rockford, Ill. . . . or check CP 6935 on handy form which is located opposite last page.)

Moves heavy equipment faster with less strain on men and machines . . .

track dolly replaces roller bars, pry bars, and other cumbersome moving tools

Self-laying track dolly allows heavy machines and equipment to be moved about plants without resort to usual slow, cumbersome w a y s.

Roller skids with gripping teeth on turntable are placed beneath wooden under equipment to be moved. As push is applied to load, units move forward — laying rollers ahead of them like a tank or tractor. To turn, length of pipe is placed over shaft which is attached to unit's cross bar. Operator turns

Dolly is easily turned to change direction of travel

the dolly in new direction desired. Since load is resting on turntable, skid is easily turned.

Dolly is constructed of high tensile alloy steels. It can support loads up to 50 tons. Cracks in plant floor are easily bridged since at least 9 inches of roller surface are in constant contact with floor.

(Multiton dolly is a product of Stokvis-Edera & Co., Dept. CP, Port Washington, N.Y. Check CP 6936 on handy form opposite last page.)

Insist on a
ONE YEAR WARRANTY
when you buy an Electric Fork Truck

All Baker battery-powered industrial trucks—including fork, platform, crane trucks and tractors—are warranted against defects for a full year from date of shipment.

As a truck purchaser, you should accept nothing less.

A one-year warranty assures you that the manufacturer has complete confidence in the materials and workmanship that go into his product. It gives you twelve months protected operation of the truck *under your conditions*—allowing ample time to detect imperfections, which might not show up during a 30, 60 or 90 day guarantee period.

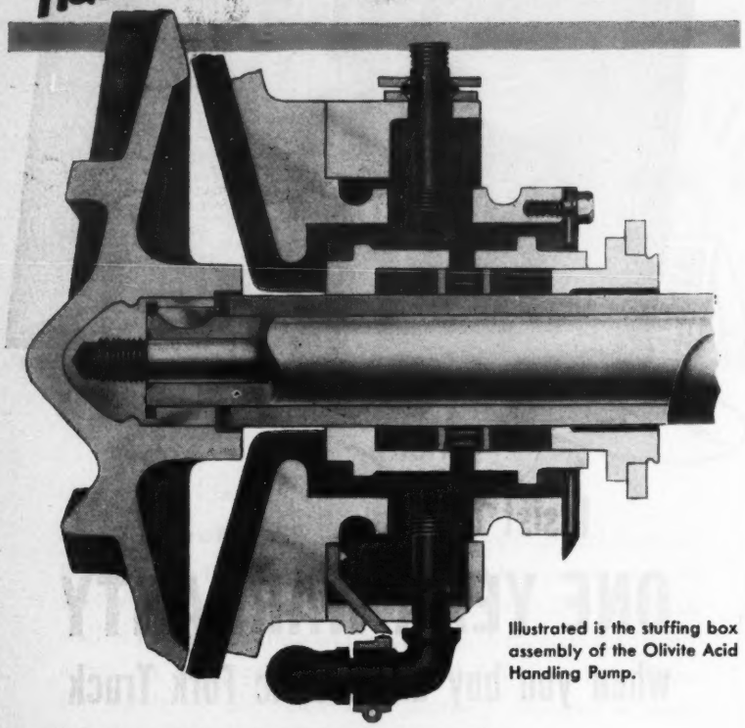
Baker Trucks have a half-century reputation for outstanding performance, long life and low maintenance. For example: a fleet of the first Baker ram trucks ever built is still in service at a large midwestern steel mill after 32 years!

Let a Baker handling engineer give you the full story, or write for Bulletin 54B. The Baker-Raulang Company, 1221 West 80th Street, Cleveland 2, Ohio.

Baker.
handling equipment

When inquiring check CP 6937 opposite last page

OLIVITE® Acid Handling PUMP



Illustrated is the stuffing box assembly of the Olivite Acid Handling Pump.

HOW IT REDUCES MAINTENANCE

1. The stuffing box floats on two rubber rings which permits shaft and packing movement. This minimizes the possibility of crushed packing or scoring of the shaft sleeve.
2. The lantern ring permits circulation of the lubricant, water or solution.
3. The resilient packing is of acid-resisting material styled for long life.
4. Simple spring loaded wing nut adjustment permits application of correct and proper pressure by the yoke on the gland and packing. No "monkey" wrench required.

Thousands of Olivite Acid-Resisting pumps have been supplied to the Process industries during the past 20 odd years. The values of these years of design, manufacturing and operating experience are embodied in every 1¼", 2" or 4" Olivite Pump you purchase. Bulletin 308-R provides full details. When writing us please outline your pumping problems.

DORR-OLIVER INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

When inquiring check CP 6938 opposite last page

briefs

from contemporary publications

KEL-F elastomer

Detailed information on a fluorocarbon rubber is presented. Properties, compounding ingredients, vulcanization, methods of fabrication and applications are included. Trade and chemical names are identified with suppliers or owners of trade marks. Eight pages, 11 tables, 8 figures. (*"Rubber Age," January,* 1955, *page* 543.)

Semimicro analysis

From Ireland come the following aids to semimicro qualitative analysis: analysis boards and frames, hanging drop cell, apparatus for absorbing hydrogen sulfide, and designs for water baths. Three pages, 5 figures. (*"Journal of Chemical Education," December,* 1954, *page* 648.)

Drainage time of pulp

Three methods of measuring drainage time of pulps for insulating board were studied. Testers employed were the TAPPI-SFMC, the "modified Green," and the British sheet machine. Sensitivity, ease of operation, reproducibility of results, and effects of variables were covered. Four pages, 3 figures, 4 references. (*"Tappi," January,* 1955, *page* 35.)

Efficiency of mixing

To gage the effectiveness of mixing liquids, or of mixing gases with liquids, one can make simple measurements with a photoelectric cell to determine interfacial area and drop diameter, which constitute practical indices. Results for several systems are reported. Ten pages, 5 tables, 12 figures, 21 references. (*"Chemical Engineering Progress," February,* 1955, *page* 85-F.)

Why foremen fail

Management and foremen each give six reasons why foremen fail, as reported in a survey conducted by an industrial service organization. (*"Mill and Factory," February,* 1955, *page* 75.)

Mixing of solids

This description of the random nature of mixing of particulate solids is augmented with experimental data, suitably analyzed. (*"Chemical Engineering Progress," January,* 1955, *page* 27-J.)

Properties of steam

Keyes and Keenan discuss the present status of steam properties and show proposed limits for future research. Comparison of American and Russian enthalpy data is included. Four pages, 8 figures. (*"Combustion," January,* 1955, *page* 34.)

Detection of metals

This description of an electronic metal detector is supplemented with an account of its application in the tobacco industry. Applications in textile, drug, rubber, and other industries are pointed out. Two pages. (*"Southern Power and Industry," January,* 1955, *page* 54.)

Lubrication program saves time

This account of substantial reduction in maintenance time through use of a planned lubrication program illustrates methods that could be generally applied. (*"Mechanical Engineering," January,* 1955, *page* 23.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .

Quality control

A statistical method for evaluating trace mechanical impurities in pharmaceutical solutions aids producer and consumer. The underlying mathematics, the reproducibility of the test, and the limitations of the technique are included. Six pages, one table, 3 figures. (*"Journal of the American Pharmaceutical Association," Nov.,* 1954, *p.* 674.)

New hygrometer described

This paper describes the development of a device for measuring relative humidity. The underlying principle is that air or other moist gas is compressed to the saturation point at constant temperature. Two pages. (*"Instrument Society of America Journal," January,* 1955, *page* 22.)

Electrical maintenance

Corrective measures for the following troubles of electrical equipment are given: vibration, corrosion, contamination, electrolysis, dust, moisture, lint, flammable vapors, operators' errors. Three pages. (*"Electrical Engineering," February,* 1955, *page* 139.)

Alarm systems

Dealing with safety interlocks and systems of alarms for chemical processes, article includes instrumentation for operations from batch to continuous flow. (*"Instrument Society of America Journal," February,* 1955, *page* 45.)

Cast iron strength

This study of the load-carrying ability of cast iron between 700° and 1000°F covers the properties of a dozen alloys. Growth and creep tests are included, and effects of annealing on hardness are presented. (*"Foundry," February,* 1955, *page* 96.)

Paper whiteness

Methods of measuring the color of paper are discussed, and formulas for expressing whiteness are compared. Chromaticity diagrams are featured. Ten pages, one table, 19 figures, 13 references. (*"Tappi," February,* 1955, *page* 78.)

Titanium alloys

In connection with the heat treatment of titanium alloys, consideration is given to the properties of their microconstituents, continuous cooling, Jominy hardenability, solution treatments, and martensite and isothermal transformations. Published data are interpreted systematically. Eight pages, 5 tables, 6 figures, 12 references. (*"Metal Progress," February,* 1955, *page* 101.)

Chromatography made easy

Simple method for chromatographic examination through use of circular paper is presented. Separation of the copper group is demonstrated. Four pages, 2 tables, 3 figures, 19 references. (*"Journal of Chemical Education," February,* 1955, *page* 95.)

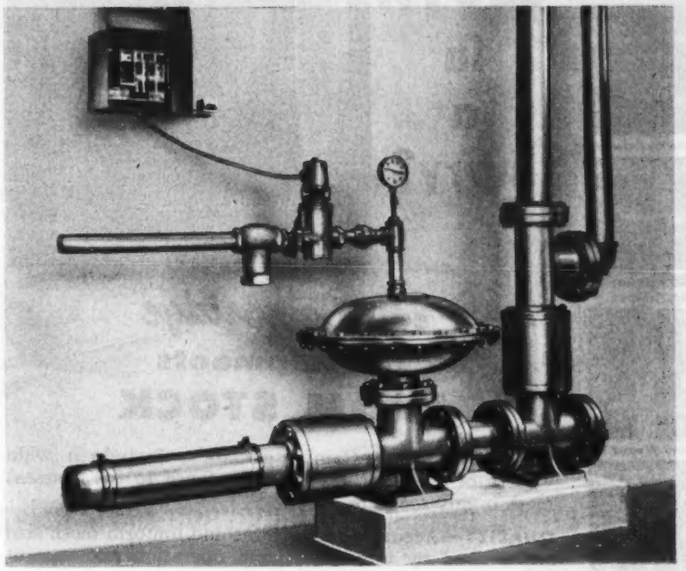
Heat transfer in suspensions

A study of heat transfer characteristics for turbulent flow in pipes (solids suspended in water) resulted in an equation based on dimensionless groups. Six pages, 2 tables. (*"Industrial and Engineering Chemistry," February,* 1955, *page* 283.)

Corrosion inhibitors

Theories and uses of corrosion inhibitors of high molecular weight are covered. Data on cost, concentration, and percentage retention are included, along with a nomograph for rate of corrosion. Water-soluble inhibitors are satisfactory. Nine pages, 3 tables. (*"Corrosion," February,* 1955, *page* 19.)

ODS
Diaphragm
SLURRY PUMP



link-free simplicity . . .
a low maintenance feature!

There's nothing novel about a diaphragm being used to transmit a pumping impulse to a stream of slurry or liquid. Up to that point the ODS Pump is similar to all other diaphragm slurry pumps.

But where the ODS Pump does differ is in the way the diaphragm gets its impulse. In the ODS Pump this is created pneumatically — not mechanically. There is no link connecting the diaphragm with the source of power. There are no bolt holes in the center of the diaphragm.

The ODS Pump has a variable volume controlled by an electric timer which may be located at any distance from the pump convenient to the operator.

This combination of "no mechanical link to the diaphragm" and "no slots or holes in the diaphragm" makes the ODS Pump just about the simplest diaphragm slurry pump you can find anywhere. You can readily appreciate what these two design features mean in the way of low maintenance. Since maintenance is an important factor in pumps, why not get all the details about the ODS Pump? In writing for our Bulletin 309-R, tell us about your pumping problem.

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Double Intermediate Crimp

Single Intermediate Crimp

Double Crimped

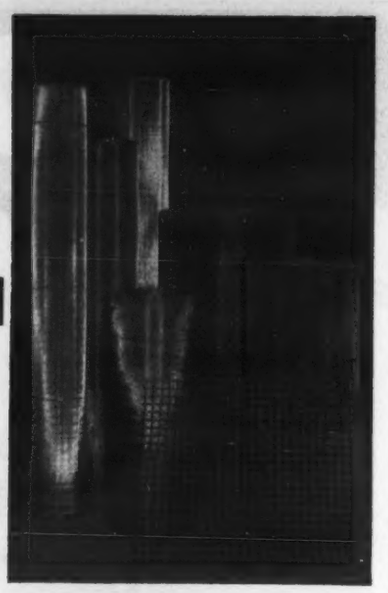
Twilled Weave

Calendered Backing

Oblong Mesh

Plain Dutch Filter

Twilled Dutch Filter



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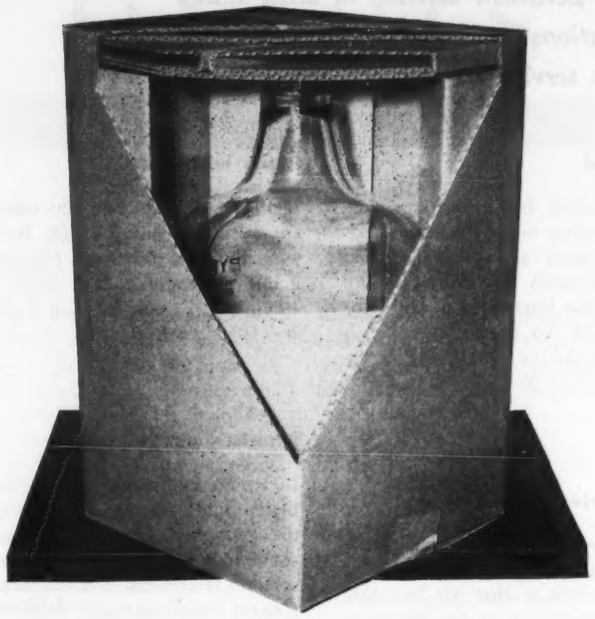
packaging



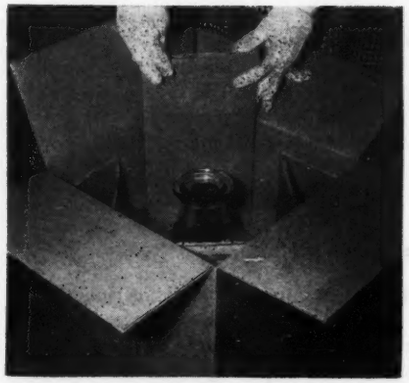
Box-within-a-box construction gives—

more practical carboy package

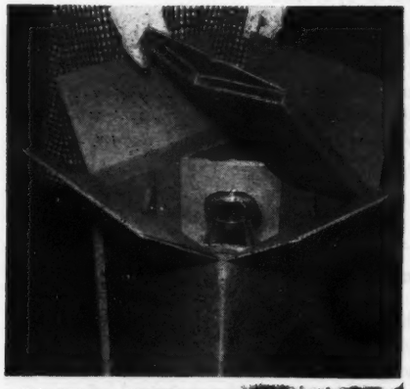
Corning Glass finds container costs less and is easier to handle, stack, and palletize

Problem: Handling, packing, and shipping five-liter glass carboys used to require special attention at Corning Glass Works, Corning, N.Y. Carboys were previously packed in excelsior, but resulting package was bulky, heavy and not always dependable. A radical design change was needed to obtain an efficient package.

The first change suggested utilized a fiberboard liner wrapped around the bottle with die-cut sheets placed underneath and on top of the ware. Although this pack would be considerably faster than excelsior, it was almost as costly because of expense of dies and necessity of setting up



Four corner pads of standard 3-ply board are inserted when bottle is in place



Scored and folded pressure pads are placed under and on top of carboy to complete box-within-a-box

special machinery to handle the project.

Solution: A pack was finally proposed, and used, which incorporates corner pads and top and bottom pads, which lock the bottle in place, actually forming a box-within-a-box. Sufficient room is left between inner and outer containers to insure against side-wall damage and foreign entry.

Results: Corning Glass has found this package more practical in all respects. Cartons are easily handled and can be stacked and palletized readily. Of equal importance, production has been stepped up inasmuch as boxing time from annealing oven to stack depends solely upon the speed of the packer, which is now increased.

The package is cheaper than those used previously, and experience has proved that there is less handling damage than before.

(Carboy package was designed and manufactured by Corning Fibre Box Corp., Dept. CP, Corning, N.Y. Check CP 6941 on form opposite last page.)

Permits handling of corrosives in any 55-gallon drum

inserts are easy to put in, take out

Uses: Linings for standard 55-gallon drums.

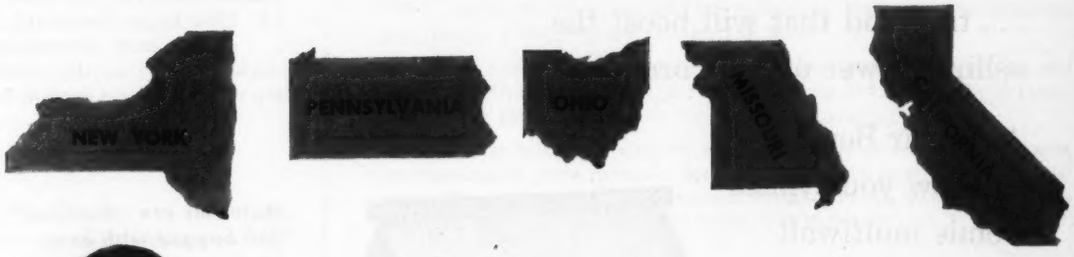
Features: Preformed, independent rubber insert permits any standard 55-gallon drum or barrel to hold acids and other corrosive materials. Inserts are easy to put in and take out of drums.

Description: Drum linings, called Drumserts are made of neoprene or sheet rubber. For insertion, rubber lining is merely set in drum and the "lip" provided on insert is lapped over top of drum and pulled taut. This permits lining to grip drum and maintain a stationary position regardless of handling.

(Rubber inserts for drums are a product of Automotive Rubber Company, Inc., Dept. CP, 12550 Beech Road at PMRR, Detroit 39, Michigan . . . or for more information check CP 6942 on handy form opposite last page.)

for safe, economical delivery of your product . . .

for fast supply service from conveniently-located plants . . .



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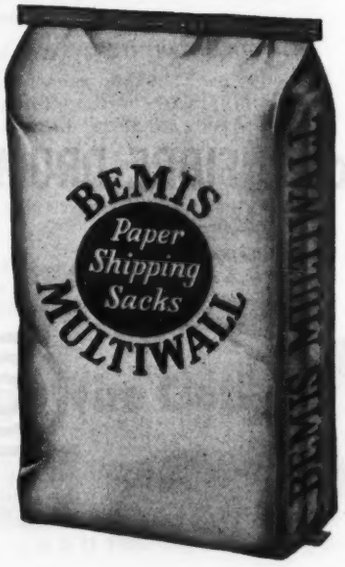
When inquiring check CP 6943 opposite last page

Want Proof?

then trust your own eyes!

And you will know that Bemis color printing of brands on multiwall paper bags is bright, crisp, color-true . . . the kind that will boost the selling power of *your* brand.

Ask your Bemis Man to show you typical Bemis multiwall printing. Trust your own eyes.



Bemis

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When inquiring check CP 6944 opposite last page

PACKAGING

Safety and convenience offered by easily-opened carton . . .

eliminates possibility of damaging contents of case when opening

Advantages of safety and convenience are offered by corrugated cartons which are opened by pulling a tab. Use of knives or other sharp tools to open case is eliminated and with them the danger to personnel and contents of the cartons.

Zip-Open Tape attached to pull-tab can be applied wherever carton can be most advantageously divided for product packaged.

(More information on Zip-Open cases may be obtained from Zip-Open manufacturer, Chicago Printed String Co., Zip-Open Tape Division, Dept. CP, 2300 Logan Boulevard, Chicago 47, Illinois . . . or for more information reader may simply check CP 6945 on the convenient Reader Service slip which is located opposite last page.)

Materials are "fluidized" and bagged with ease by weigher unit . . .

hard-to-pack powders and granulated products are filled quickly in clean operation

Uses: Weighing and filling powdery and granular products in multiwall valve bags.

Features: To assure quick, clean filling of hard-to-handle products, compressed air at low pressure is introduced through an air pad at bottom of conditioning chamber of machine. Air surrounds particles of material at base of chamber and makes them buoyant or "fluidized". Weight of material in conditioning chamber and supply bin above creates pressure on these buoyant particles and ejects them through a filling tube into bag.

Description: In operation, filling machine, called the Fluopacker, does not use any moving parts to cause material to flow through filling tube. "Fluidizing" of material takes place at a pressure of 3

☆

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to 4 psi. As a result, material is not aerated above its natural flow rate. Lower aeration means less dust and allows use of smaller bag.

Weight control in unit is maintained by an air-operated cut-off lever which squeezes rubber connection between filling tube and packer opening. When tube is completely shut it presents a positive shield which prevents leakage of material. Filling trials have shown, in many instances, weight accuracies within a plus or minus four-ounce range. Single and multiple tube machines can pack from one to twenty bags a minute.

Packer is not recommended for batch packing operations. Another disadvantage at present is head room of 17 to 22' above floor which is required in some cases.

(Bag filling machine is manufactured by the Food Machinery and Chemical Corp., and is sold by St. Regis Paper Co., Dept. CP, 230 Park Ave., New York 17, N.Y. . . . or for more information check CP 6946 on handy form opposite last page.)

Designed for smaller plants, case sealer requires less than 28 sq ft space

Uses: Primarily for smaller plants where production is limited and space is at a premium.

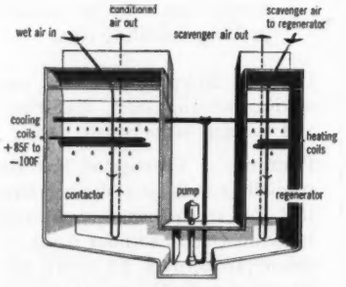
Features: Case sealer is only 8' long and requires less than 28 sq ft of floor space.

Description: Small case sealer, designated Model 53-8, automatically glues and seals approximately 200 to 600 standard size cases per hour depending on the length of compression section. Seals are made top and bottom or top only as desired. Overall width of unit is 36½".

Machine is equipped with electric glue heaters which can be used to speed drying time of sealed case. Ordinary commercial glue is used. Unit is built in one piece continuous welded construction. Gluing and compression sections are built as a single unit. One motor only with variable-speed control is used to power unit. There are no limit switches.

(Case sealer is a product of Elliott Manufacturing Co., Dept. CP, 1735 Ventura, Fresno, California . . . or for more information check CP 6947 on handy form opposite last page.)

Solubility of sulfur dioxide is shown conveniently in nomograph form on page 204.



Air to be conditioned passes through the contactor, where an absorbent solution removes moisture (the amount depends on the automatically-controlled temperature of the solution). In the automatic regeneration, about 15% of the solution is heated, and the moisture it releases is blown out the window.

how

FILM MAKERS CUT CASTING, CHILLING, DRYING COSTS

The leading manufacturers of photographic film and paper needed dry air at low temperatures for their casting, chilling, and drying processes. And they wanted it *without* frost, excessive reheating or aftercooling, high power requirements, carry-over, corrosion, and high maintenance and service costs.

They obtained air at the precise conditions they wanted by installing Kathabar humidity conditioning units, and avoided problems common to other dehumidification systems. For the casting process, where film dope changes from a viscous liquid to a transparent strip, Kathabar units deliver air at 104F and 47.5 grains/lb. with 53F water. For chilling the emulsion, they deliver air at 6.5F, 5 grains/lb., frost-free with OF refrigerant. For drying the emulsion, they provide 140F, 36-grain air, with 75F water.

The results have been better process control, improved product quality, and lower costs. One manufacturer, for example, saved $40,000 anually in excess refrigeration by using Kathabar for drying photographic paper.

Similar results have been achieved with Kathabar in other industries: foods, pharmaceuticals, petrochemicals, brewing, glue, candy, atomic energy, lithography. For details, write for Literature Group K54-1C, including our just-published brochure, "HUMIDITY CONDITIONING."

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HUMIDITY CONDITIONING

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When inquiring check CP 6948 opposite last page

For stopping air leakage—when removing powdered or granulated materials from dust collectors, air classifiers, spray or rotary dryers and pneumatic conveying systems . . . it can be done more efficiently and economically with a PRATER ROTARY AIRLOCK—the answer to industry's need for a *heavy duty unit.*

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OVERSIZED BEARINGS!
Standard in all PRATER FEEDERS. Self-contained, self aligning, lubricated and sealed for life.

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Foremost Builders of Airlocks

When inquiring check CP 6949 opposite last page

PACKAGING

Design of inner sleeve gives more positive bag closure . . .

acts on "check valve" principle in multiwalls

Recently designed inner sleeve valve for multiwall paper fertilizer bags is distinguished by the patterned creases in the valve sleeve. Valve functions in much the same way as a check valve on a water pipe, which permits free flow in one direction only. Sleeve design permits a firmer, more secure closure, giving maximum sifting protection and practically eliminating leakage.

Valve's fast action on packing spout keeps product out of valve pocket, which reduces chance of moisture getting into bag through "wick" action of hygroscopic products.

("Mr. Little" sleeve valve for multiwalls is a development of Bemis Bros. Bag Co., Dept. CP, 408 Pine St., St. Louis 2, Mo. . . . or for more information check CP 6950 on handy form opposite last page.)

One-piece, celled box gives fragile items needed protection . . .

simple construction reduces packing, handling time

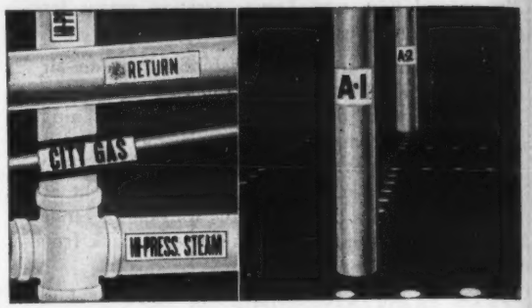
Uses: Shipping glassware, cosmetics, writing inks, medicines, and various other small items.

Features: Corrugated box has specially-scored and die-cut flaps that fold in to form 4, 6, 8 or 12 individual cells without using interior pieces, or 8, 12, or 16 cells by using a single corrugated divider pad.

Simplicity of construction greatly reduces packing and handling time and cuts box inventory problems in that storage for only one piece is required.

Description: Setup of one-piece celled box is simple: end and side flaps on bottom are

Self-Sticking Markers Cut Maintenance Time and Costs



Self-Sticking Markers which cut maintenance time and costs are available from the W. H. Brady Co., Milwaukee. One of their widely-used products, ALL-TEMPERATURE PIPE MARKERS, stick permanently to pipes as hot as 300°F. Millions of them in use in plants of all types today. They conform to ASA standards and give you a fool-proof, cost-cutting method of pipe identification. Write for Bulletin No. 135-B.

Brady Self-Sticking DOTTED LINE AISLE MARKERS offer a fast, low-cost way to mark aisles. They are so tough they outwear painted lines 5 to 1. Miles and miles of aisles are marked with these markers in plants everywhere. Write for Bulletin No. 141.

A quick, economical method for marking areas, bays, posts, bins, pallets, etc., is found in Brady Self-Sticking All-Purpose NUMBERS and LETTERS. These individual NUMBERS and LETTERS let you make up any combination of markings right on the spot. Stocked in six sizes, these handy Markers fit many plantwide Marking needs perfectly. Write for Bulletin No. 165.

Manufacturer: W. H. Brady Co., 757 W. Glendale, Milwaukee 12, Wis.

When inquiring check CP 6951 opposite last page

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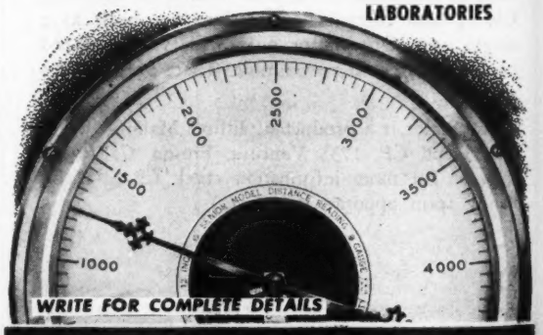
- APPROVED BY UNDERWRITERS' LABORATORIES



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New Welded Construction Equals Seamless or Spun

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When inquiring check CP 6954 opposite last page

tucked inside where they dovetail to form half-height partitions. Box is then loaded and top flaps are folded in to form the upper half of the cells. For smaller items, a flat corrugated divider pad is placed across the lower partitions before the top flaps are closed, thus doubling the number of cells.

(Celled box, called Form-A-Cel, is a product of Hinde & Dauch Paper Company, Dept. CP, 5103 Decatur St., Sandusky, Ohio. . . . or for more information check CP 6955 on handy form opposite last page.)

Better design featured on bagging scale

A detailed description of company's improved bagging scale, lists of seven specifications and five features of the unit are presented in two-page data sheet. Also included are a photo of the scale and a dimensioned engineering drawing.

Product data sheet No. 5401 is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N.J. When inquiring specify CP 6956 on handy form opposite last page.

✦ ✦ ✦

THAT'S INTERESTING

Convenient cookery by automation

To demonstrate how the same techniques can be applied in industry, automation has briefly invaded the kitchen. Using a magnetic tape recorder-playback machine, an exhibit at a recent show demonstrated cake making at its "automated" best. The tape serves as a memory device which cues various relays and apparatus into performing the proper action at the proper time—in this case measuring, combining, and mixing cake ingredients. The advantage is that the tape and connected units do what they're told and won't get tired, bored or be distracted.

HI-BAKE LININGS for your Hard-to-Hold products

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DOUBLE PROTECTION

FIRST . . . *With Bennett carefully applied "Hi-Bake" linings, scientifically selected to properly hold your individual product.*

SECOND . . . *With Bennett's pre-tested containers and superior workmanship . . . the result of over 40 years of experience in steel container manufacture.*

Correct application methods usually account for the success or failure of a "Hi-Bake" container lining. Bennett has the most modern equipment, extensive research facilities and experienced personnel to assure you positive protection for your products. Extreme care is taken to follow only approved and pretested methods of application. Single coat as well as multiple coat lining applications are diligently checked for full coverage and proper thickness of each coat throughout the pail interior.

Bennett "Hi-Bake" lined pails will safely contain such active ingredients as paints, adhesives, insecticides, inks, foods, soaps, cleaning compounds, and most chemicals.

Bennett engineers welcome the opportunity to consult with you as to the proper type of "Hi-Bake" lining for your specific products. No obligation is involved. We will gladly submit lined sample pails for your own tests. Call or write us today for more information.

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Lubricating and Insulating Oil Conditioners, Filters and Vaporizers
Solvent Recovery Systems—Vacuum Stills and Filters

HYGRADE METAL FINISHING DIVISION

Mechanized Metal Cleaning and Phosphatizing Systems
Chemical Plating Equipment
Electrostatic Spray Painting Equipment
Paint Booths and Bake Ovens
Filters for Phosphate and Plating Solutions
Systems for Elimination of Stream Pollution
Pressure Vessels and Weldments for Process Industry

ORDNANCE EQUIPMENT DIVISION

Pneumatic Conveying Systems
High Efficiency Centrifugal Separators
Stationary and Portable Vacuum Cleaning Equipment
Process Equipment
Pneumatic Systems for Radioactive Materials

Keep your eye on the forward march at Hoffman. Write for technical bulletins describing the above systems—and for full details on how we can make your problems our responsibility.

INDUSTRIAL DIVISIONS

U.S. HOFFMAN MACHINERY CORPORATION

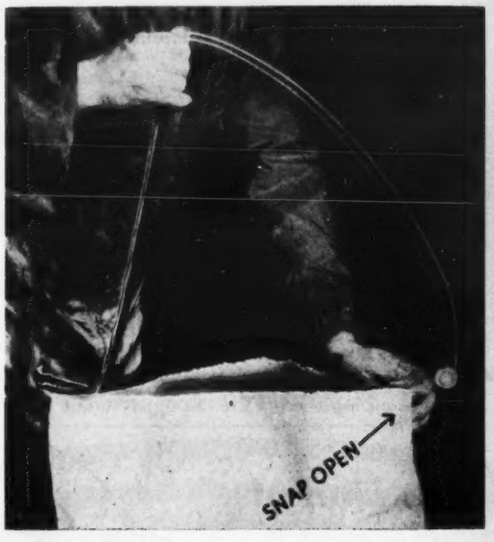
DEPT. CP 105 FOURTH AVENUE, NEW YORK 3, N. Y.

When inquiring check CP 6958 opposite last page

Multiwalls made easier to use by "snap-open" device

eliminates lost time and material waste

Development of a snap-open multiwall bag should prove a time and material saver for bag users in the chemical, fertilizer, and other industries. Multiwalls with this feature can be opened with a quick snap of the wrist, eliminating need for knives, scissors, or other customary opening instruments.



One quick snap (shown by tracer lines) is all that is required to open bags

Quick-opening device is achieved by placing a series of small perforations in one corner of the bag under the tape and near the sewing line. By merely grasping the tape at this corner and pulling sharply upward, an opening is instantly started. It can be stopped and held at any point convenient for controlled spout pouring, or it can be continued along the entire length of sewing line if desired.

("Snap-Open Sack" multiwall bags are development of Hudson Pulp & Paper Corporation, Dept. CP, 477 Madison Ave., New York, N.Y. Check CP 6958A on handy form opposite last page.)

Describes filling machinery for various dry materials

Packaging machinery, net and gross weighing or filling equipment for a variety of dry materials is described in detail in 12-page bulletin.

Cat 55 is available from Weigh Right Automatic Scale Company, Dept. CP, East Mills Rd., Joliet, Illinois. Check CP 6959 opposite last page.

Where large units aren't economical hand sealer for plastic films does the job . . .

unit weighs less than one pound, heat-seals any shape quickly

Uses: Heat-sealing directly on polyethylene, Pliofilm, and other thermo-plastic films. Unit is particularly applicable where large production equipment is not economical.

Features: Hand sealer weighs less than one pound. It is easy to handle and quickly seals on flat, straight, or irregular shapes.

Comfortable grip makes sealer easy to handle

Description: Heat-sealer is made in three models: No. 50 for polyethylene and Pliofilm; No. 51 for cellophane; and No. 52 for cutting and sealing. On all models temperature is adjustable from 200 to 450°F. Heating element uses 50w and operates on AC or DC.

(Heat-sealer for plastic films is a product of Sealine Mfg. Corp., Dept. CP, 4716 W. Lake St., Chicago 44, Ill. . . . or for more information about this product reader may simply check CP 6960 on convenient Reader Service slip which is located opposite last page.)

For more that's new in processing . . .

check the handy product directory (pages 214 to 217.) All the latest products, services, and ideas presented in this issue are listed there.

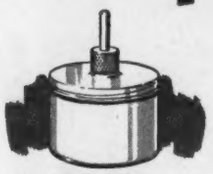
You name it-MOYNO® pumps it!

Foods

Potato salad, chow mein, peas, cream-style corn, tomatoes, molasses, chocolate.

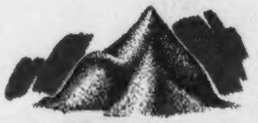
Chemicals

Caustics, acids, dyes, petroleum solvents, soaps, sludges, latex, synthetic resins.



Pastes

Paper coating, starch, seam paste, size, adhesive dope, heavy grease, graphite sludge.



Abrasives

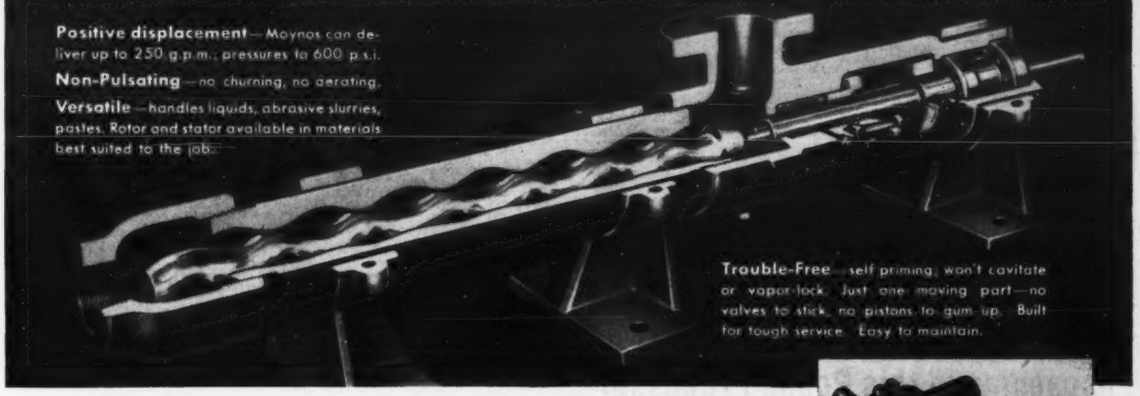
Insulator clay, frit, ground glass and water, porcelain glaze and enamel, cement, plaster.

FEATURES OF THE MOYNO THAT MAY SOLVE YOUR MATERIALS-HANDLING PROBLEM

Positive displacement—Moynos can deliver up to 250 g.p.m., pressures to 600 p.s.i.

Non-Pulsating—no churning, no aerating.

Versatile—handles liquids, abrasive slurries, pastes. Rotor and stator available in materials best suited to the job.



Trouble-Free—self priming, won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

R & M Moynos handle almost anything that can pass through a pipe

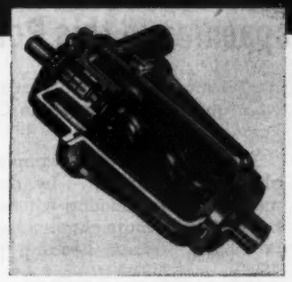
The Moyno is a problem-solving pump. And whether your problem is one of materials, maintenance or flow, there's a better-than-even chance that the Moyno is the pump you're looking for.

Here is a completely different kind of pump that handles almost anything that will push through a pipe, from free-flowing liquids to non-pourable pastes—even materials containing relatively large particles or abrasives.

This is how the Moyno works: a screw-like rotor turning within a double-threaded stator creates cavities which *progress* toward the discharge end of the pump, carrying the material being handled. The result is a smooth, steady flow, free from pulsation and turbulence.

The pumping elements of the Moyno are available in a wide range of materials, depending upon the substances to be pumped. From stainless steels and synthetic rubber to tool steels, bronze, plastics—there is a Moyno that will do the job you want, and do it with remarkable efficiency.

Industrial-type Moynos are available with capacities to 250 g.p.m.; pressures to 600 p.s.i. Small Moynos (see inset), used as original equipment, serve on washers, water pumps, sprayers, and many other products.



FREE...

this informative bulletin

Tell us your pumping problem—let's see how the Moyno can help solve it. If necessary, we'll be glad to run tests for you in our own laboratories. In any case, get the details on the Moyno—mail the coupon below.

R&M®

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO • BRANTFORD, ONTARIO

Fractional and Integral HP Motors

Desk, Window, and Household Fans

Hoists and Cranes

Moyno Pumps

Propellair Industrial Ventilating Equipment

Robbins & Myers, Inc.
Pump Division, Springfield, Ohio (CP)

Please send Bulletin 30C on Moyno Pumps

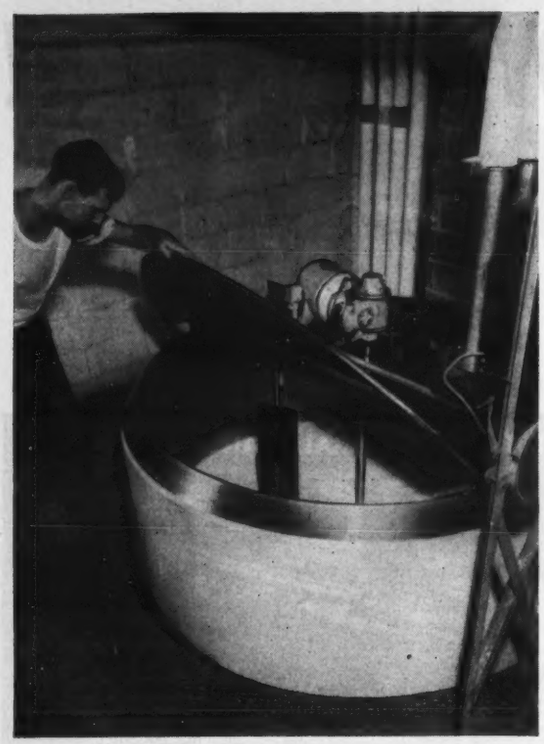
Name _____ Title _____

Company _____

Address _____

City _____ State _____

When inquiring check CP 6961 opposite last page



You can't tell at a glance what's happening in this Round Processor

It takes more than a glance at a photograph to know what goes on in a versatile Cherry-Burrell Round Processor.

This Processor, for example, might be heating almost *any* liquid . . . by *any* of four different methods: spray heating with steam or recirculated hot water; pressure channel heating with hot water or steam; vacuum heating; pressure cooking to 250°F.

Or it might be spray cooling with well, city, or tower water; channel cooling with city, well or tower and refrigerated water; or by combination direct expansion and pump spray.

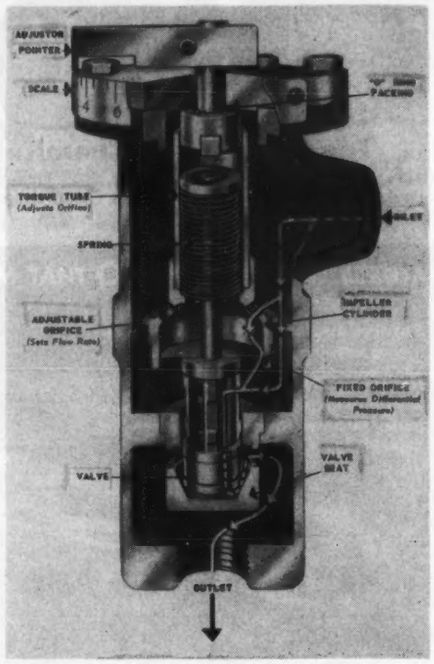
It might also be blending and mixing with either a long sweep agitator or a scraper blade agitator, depending on the product.

This much is certain, however. Whatever your product . . . your process . . . your heating or cooling facilities . . . you'll probably find a stainless steel Cherry-Burrell Round Processor to meet your particular need. Choice of four models, from 200 to 1000 gallons.

For further details, see your Cherry-Burrell Representative or write for Round Processor bulletin.

CHERRY-BURRELL CORPORATION
427 W. Randolph Street, Chicago 6, Ill.
Equipment and Supplies for Industrial and Food Processing
SALES AND SERVICE IN 57 CITIES—U. S. AND CANADA

When inquiring check CP 6962 opposite last page



Here's how flow regulator works: Entering at the side, top, liquid flows downward through regulator. Flow rate is measured by an annular fixed orifice, and pressure drop across this orifice is balanced by force of stainless steel spring. Any disturbance within filter system causes orifice disc to move and adjust compensating valve. Thus, an increase in inlet pressure forces disc down and closes valve proportionately. With an increase in back pressure, disc rises, opening valve and increasing flow to set rate. Adjustment is immediate, restoring pressure drop and flow through orifice to the original values.

Continual valve-turning during filtration cycle is out . . . automatic regulator assures top filtration results because —

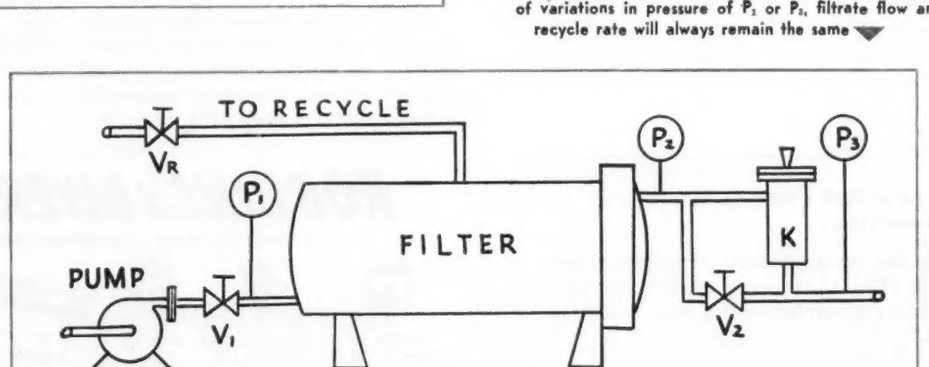
filtrate flow stays constant

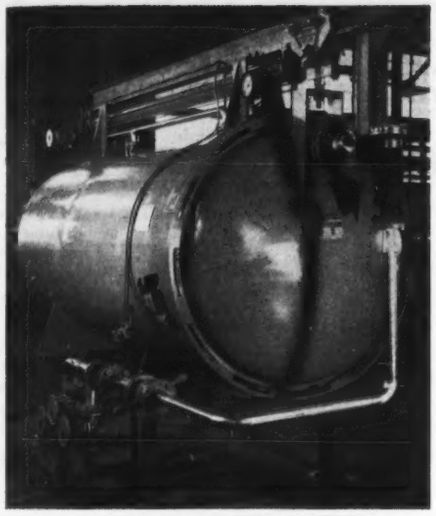
Experience as well as theory shows that filtrations proceed best when rate of flow of filtrate is kept constant throughout cycle. Volume of filtrate, cake development, and clarity of product are greatest at constant rate flow. One of the ways to do this is to start filtering at a low pressure and then gradually increase pressure as cake resistance builds up. Another way is to use an oversize centrifugal feed pump, throttle it to desired flow rate, and then adjust it occasionally when flow rate falls off.

Both of these procedures work fairly well, but they do have some drawbacks. One of these is that they require manual valve-turning at regular intervals. This is time-consuming and almost makes it necessary for operator to keep one eye on filtration at all times.

Another important disadvantage is that when filtering low porosity solids with high settling rates (i.e. gypsum solids, bleaching clays, copra fines, coffee extracts, etc.), there is a possibility of solids

Drawing shows flow regulator (k) installed in typical filtering system. Device eliminates manual operation of valves (V_1, V_2, or V_3) during filtration. Regardless of variations in pressure of P_1 or P_2, filtrate flow and recycle rate will always remain the same





Regulator (arrow) installed in filtrate line of horizontal pressure-leaf filter

settling out in filter tank when filtrate flow rate drops off. Whenever this happens it becomes necessary to recycle a portion of filtrate in order to keep agitation within tank or rise of prefilt greater than settling rate and to keep solids in suspension. This also requires additional attention and continual turning of valve in recycle line as pressures and flow rates vary.

Problem is being solved on certain pressure-leaf filters by installing an automatic flow rate regulator in filtrate line leading away from filter. Regulator automatically maintains constant flow rate throughout filtration cycle by compensating for increases in cake resistance. Dial is simply set at pre-selected rate and device does the rest. Filtrate flow varies less than three per cent from presetting, for pressure variations of 125 psi.

Since overall pressure drop across filter and tank remain constant (pressure-drop through regulator decreases in direct proportion to increase through leaves), pump characteristics and control are simplified. Because filter tank operates at constant pressure, pump is always operating against a constant head. In the case of low porosity solids with high settling rates, recycling therefore no longer presents a problem. Once proper recycle rate has been determined, it is a simple matter to set recycle or prefilt return valve at selected rate, and then forget it.

If a single pump is supplying a number of filters, regulators can also be used. By putting flow regulators on filtrate lines of each of the filters, individual units can be set to deliver, and maintain, reasonably constant rates of flow. Shut-down of one filter does not disturb flow into those remaining in operation.

(*Continued on page* 137)

• **FASTER** ULTIMATE DISPERSION, FASTER DISSOLVING WITH THE COWLES DISSOLVER

2 to 20 times faster! In ultimate dispersion, dissolving and disintegration of materials, the Cowles will do the job 2 to 20 times faster than conventional machines... will cut down your time per batch. You save on space. You save on labor. You save on horsepower. Cowles Dissolvers are easy to operate and clean, are of rugged construction, need little maintenance.

Where dispersion, milling and post-mixing are involved, the Cowles functions as an ultra-fast pre-mix unit—guaranteed to give *all mills* greater volume production—faster ultimate dispersion—and fastest post-mixing.

In chemical processing, the Cowles is an efficient, high speed reactor—offered in all types of corrosion resistant metals—with glass lined tanks—with all types of heating and cooling systems—to operate under pressure, vacuum or with reflux returns. For gas-liquid—for liquid-liquid—for solid-liquid reactions—investigate the Cowles.

The Cowles Dissolver is **extremely versatile,** adapting easily to any mixing, dispersion or dissolving job. It will be specifically engineered to meet the exact requirements of your operation.

if you process...
Plastics • Resins • Paints
Vitamins • Plastisols
Nitro-Cellulose Lacquers
Rubber Solutions • Inks
Various Chemical Agents
Organisols • Gum Solutions
Enamels • Biologicals
Coatings • Explosives
...the Cowles Dissolver will increase your production, handle even high viscosities, increase profits!

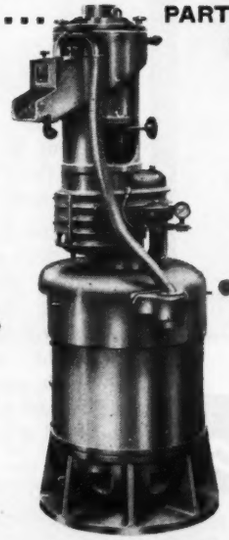
HERE'S NEWS

A NEW DISSOLVER & MILL COMBINATION FOR HIGH-SPEED, HIGH-VOLUME PRODUCTION!

The news is—the owners of Morehouse Industries have purchased the Cowles Dissolver operation of the Cowles Company, Inc. of Cayuga, N.Y. **It means**—an unbeatable combination of processing equipment and technical know-how from one source—available through an expanded Morehouse-Cowles distributing organization.

•**FASTER...** PARTICLE REDUCTION WITH MOREHOUSE MILLS

if you process...
Paints • Inks • Foods
Chemicals • Plastics
Lubricants • Ceramics
...you can increase volume and profits with Morehouse Mills!



These increases in production guaranteed... up to 4 times the volume of ordinary mills when used with conventional premixers... when used with Cowles the production jumps up to *10* times that of ordinary mills! For grinding, homogenizing, emulsifying, despersing, disintegrating, blending, Morehouse Mills have been further improved to give even greater production volume!

Modern Morehouse Mills are low in first cost, easy to maintain, unusually compact, lightweight, completely proved in the field. Made only by Morehouse Industries of Los Angeles.

MOREHOUSE COWLES

Morehouse-Cowles, Inc.
1150 San Fernando Rd.
Los Angeles 65, Calif.
Sales Offices in Principal Cities (Cable Address "MORESPEED," Los Angeles)

•**FASTEST**—MOST ECONOMICAL PRODUCTION WITH COWLES DISSOLVER-MOREHOUSE MILL COMBINATIONS!

Morehouse-Cowles sells speed—volume production—higher profits for your entire operation, gives you **terrific flexibility in your production line!** Ask for pre-test of your materials by Morehouse-Cowles technicians. Ask for full trials in your plant with any size equipment. Inquire about leasing arrangements and time payment plans in U.S. and Canada. Both the Cowles Dissolvers and Morehouse Mills are *fully guaranteed.* **Write today!**

When inquiring check CP 6963 opposite last page

IMPROVED

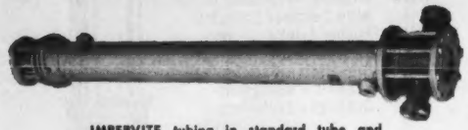
Impervite

IMPERVIOUS GRAPHITE

HEAT EXCHANGERS

RESIST SPALLING • GIVE MORE UNIFORM HEAT TRANSFER

IMMUNE TO EFFECTS OF ALMOST ALL CORROSIVES



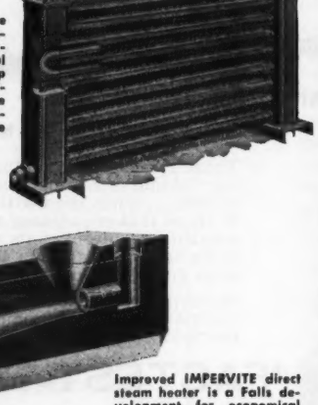
IMPERVITE tubing in standard tube and shell units resists spalling — gives more uniform heat transfer.

Exclusive CROSS-BORE exchanger design operates at pressures to 200 psi — resists physical shock — is easy to clean.

Four types of improved IMPERVITE immersion heaters are furnished as standard.

Experience, imagination and facilities make Falls the outstanding supplier of special, metal alloy exchangers for all purposes.

Improved tube extrusion and impregnation combined with special low-pressure-drop cells result in better performance records for IMPERVITE cascade coolers.



Custom designed 685-tube exchanger pictured indicates wide variety of IMPERVITE specials produced.

Improved IMPERVITE direct steam heater is a Falls development for economical heating of pickling solutions.

WRITE FOR CATALOG

Falls Industries Inc.

Cleveland's newest industrial suburb

31909 AURORA ROAD • Phone: CHurchill 8-5357 • SOLON, OHIO

When inquiring check CP 6964 opposite last page

Injection molding press is fully automatic . . .

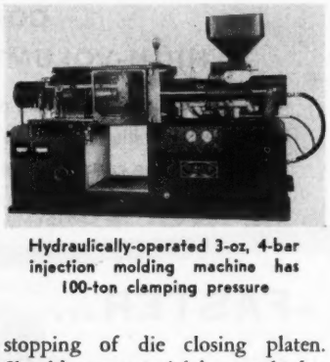
features extra-large platens

Uses: For injection molding of various plastic parts.

Features: Machine is complete to extent that it is only necessary to bring in power supply to its control box.

Fully automatic, it is equipped with low-pressure safety device for preventing mold damage. Machine, basically a 3-oz unit, has extra-large mold platens, 100-ton clamping pressure, and heating cylinder equal in size to most 6-oz machines.

Description: Hydraulically-operated 3-oz, 4-bar injection molding machine has pre-pack on injection piston that increases capacity to 4 oz when needed. Operation of all movement is fully hydraulic, including snubbing and



Hydraulically-operated 3-oz, 4-bar injection molding machine has 100-ton clamping pressure

stopping of die closing platen. Should any material be caught between die faces, full clamping pressure is not exerted and no injection of material will occur. At this point a red light goes on and bell starts ringing.

Pressure is supplied by Vickers unit coupled with specially designed valves which eliminate excessive piping. Automatic feeding is accomplished by means of starved weight material-feeding device which automatically stops feeding if material builds up excessively ahead of injection piston.

(Injection molding machine is product of De Mattia Machine and Tool Company, Dept. CP, Chelsea Road, Allwood, Clifton, New Jersey. Check CP 6965 opp. last pg.)

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED" GAYCO brings you all these:

Range 60 to 400 mesh

greater capacity

25 to 30% greater production

Cleaner Tailings

Uniform Products

Slow speed for slow wear

Quick and easy adjustments

If you have an exceptionally hard separating problem, TRY THE GAYCO.

Universal Road Machinery Co.

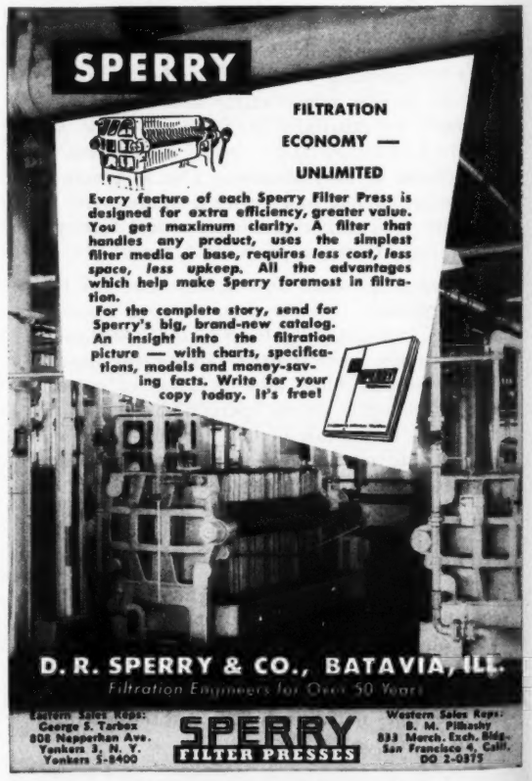
Robert M. Gay-Division

Factory and Laboratory, Kingston, N. Y.

117 LIBERTY STREET NEW YORK 6, N. Y.

Canadian Representative: F. H. Hopkins & Co., Ltd., 3500 Decarie Blvd., Montreal, Que.

When inquiring check CP 6966 opposite last page


SPERRY
FILTRATION
ECONOMY —
UNLIMITED
Every feature of each Sperry Filter Press is designed for extra efficiency, greater value. You get maximum clarity. A filter that handles any product, uses the simplest filter media or base, requires less cost, less space, less upkeep. All the advantages which help make Sperry foremost in filtration.
For the complete story, send for Sperry's big, brand-new catalog. An insight into the filtration picture — with charts, specifications, models and money-saving facts. Write for your copy today. It's free!
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SPERRY FILTER PRESSES
Western Sales Reps: R. M. Pilkenby 833 March. Exch. Bldg. San Francisco 4, Calif. DO 2-0875

When inquiring check CP 6967 opposite last page

FILTRATE FLOW

(*Continued from page* 135)

Regulator is self-contained unit and requires no air lines or other auxiliaries for operation. It can easily handle any slurry that may pass through it at beginning of filtration cycle. Device comes in various sizes, ranging in capacities from two to 550 gpm (water). Construction is either all stainless steel, or steel casing with stainless steel valve and trim.

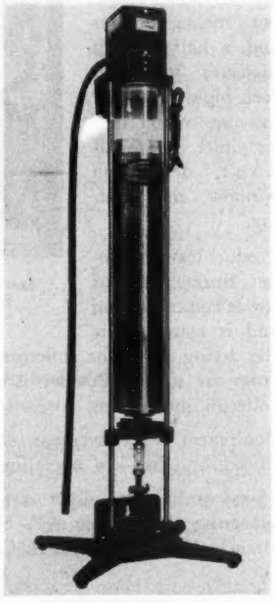
(Type SA automatic flow rate regulators are product of The W. A. Kates Company, Dept. CP, 430 Waukegan Road, Deerfield, Illinois . . . or check CP 6968 on handy form opposite last page.)

(Model H horizontal pressure-leaf filters are product of Process Filters, Inc., a subsidiary of Bowser, Inc., Dept. CP, 1807 Elmwood Avenue, Buffalo 7, New York. . . . or check CP 6968A opp. last pg.)

Demineralizes water at 10 gph, is self-contained unit

Uses: For producing relatively small quantities (up to 10 gph) of pure water.

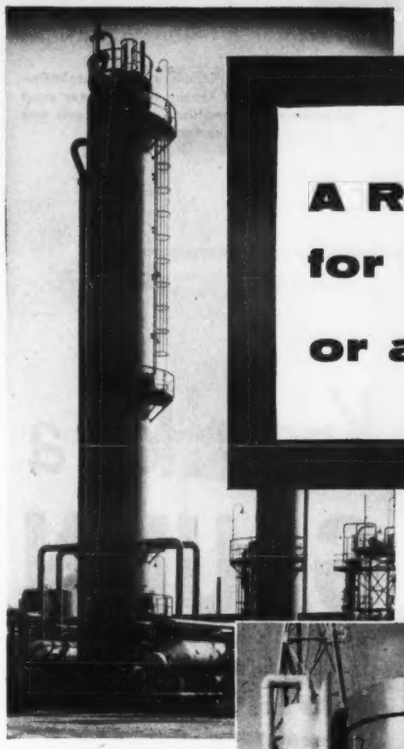
Features: Demineralizer can be used with single bed of mixed cation and anion resins, or as two-bed system with separate cation and anion resin beds in the single column. With either system, unit produces water with as little as 10 grains sodium chlorides (expressed as $CaCO_3$). Unit is capable of removing silica and CO_2 with special resins.



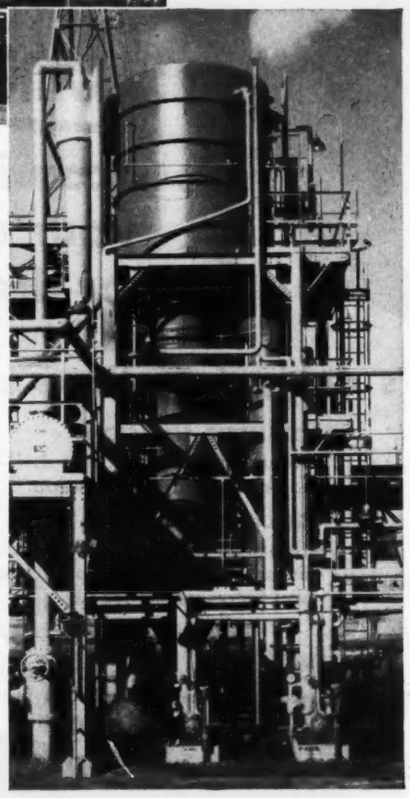
Packaged mono-column demineralizer may be mounted on wall or placed on stand for bench use

Description: Demineralizer is self-contained, packaged unit ready for immediate use upon connection to raw water source. Unit comes complete with all necessary influent and effluent piping, purity meter, and valves.

(Model R-M-8 dual-type demineralizer is product of Penfield Manufacturing Company, Inc., Dept. CP, 19 High School Avenue, Meriden, Conn. . . . or check CP 6969 on handy form opposite last page.)



A Reactivator tower for Monoethanolamine... or a Urea Concentrator...



...a pressure vessel or a storage tank... Chicago Bridge & Iron Company is building them throughout industry today. CB&I is a specialist... with strategically located plants staffed to design, engineer, fabricate and erect welded steel plate structures to meet the most exacting requirements. Our plants are equipped for stress relieving and X-raying and have facilities for pickling and painting fabricated material.

When planning welded plate structures of any sort, be sure to write Chicago Bridge & Iron Company's nearest office. They will provide information, estimates or quotations.

Top left: 10-ft. 6-in. diam. by 87-ft. 6-in. high monoethanolamine (MEA) reactivator, fabricated by CB&I for the Grand River Chemical Division of Deere and Company at Pryor, Oklahoma.

Lower left: Conkey single effect evaporator of the vertical tubular type, all stainless steel construction, for production of high concentration urea liquors for subsequent "Prilling".

CB&I

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • New York
Philadelphia • Pittsburgh • Salt Lake City • San Francisco • Seattle • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

When inquiring check CP 6970 opposite last page

Dewey & Almy Chemical Co. installation showing 300 GPH Gaulin Homogenizer used for making resin emulsions, shoe cements and adhesive formulations.

Know How a GAULIN Homogenizer

can improve your emulsions or dispersions

Here's what it's doing for others...

PIGMENT DISPERSIONS
Gives a faster, more uniform suspension with less temperature rise.

WAX OR OILS
Makes a smoother, better appearing product. Stops separation.

LATEX & RESINS
Provides more uniform monomer emulsions. Better polymerization control.

COSMETIC EMULSIONS
Improves texture. Boosts shelf-life. Locks perfume in against evaporation.

GREASES
Improves stability and uniformity or simplifies manufacturing. Improves lubricating value and increases service life.

What can it do for you?
Send us a sample of your product today. Our complete testing facilities will give you the answer — without obligation.

GAULIN PILOT PLANT HOMOGENIZER
Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.

GAULIN TWO-STAGE COLLOID MILL
Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045". Only 45 seconds clean-up required in changing colors. 12" head room. 12" x 17" floor area.

Gaulin
Manton-Gaulin
MANUFACTURING COMPANY, INC.
55 GARDEN STREET, EVERETT 49, MASS.
World's largest manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills

When inquiring check CP 6971 opposite last page

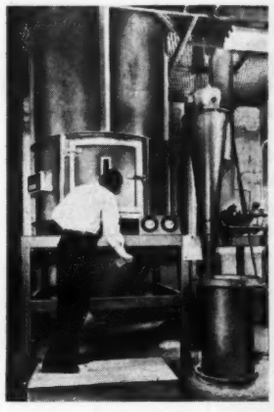
Semi-works spray dryer can be assembled on-the-spot

comes as complete unit; prefabricated parts fit through usual factory openings

Uses: For semi-works or other applications where a small, compact spray dryer is desired.

Features: Of prefabricated design, unit is transportable through usual factory openings and can be assembled by ordinary shop labor in a few hours.

Description: Dryer is stainless steel, except for external bracing. It is furnished as a complete operating unit, including heater, spray nozzle, product collector, and supporting structural steel. Working space is about seven by nine feet.



Spray dryer requires only 7 x 9 ft working area

Dryer incorporates gas-fired air heater for drying air to any desired temperature between 200 and 750°F. Conical-bottom drying chamber measures four and a half feet in diameter by seven feet high. Chamber has top central hot-air inlet, clean-out door, observation window, and lighting.

Product leaves chamber through tip of lower conical section and is conveyed by the drying air to the collector, where it is separated from air stream. Powder is discharged at base of collector into drums.

Equipment is convenient to operate, reasonably priced, and has low operating cost.

(Semi-works spray dryer is product of Bowen Engineering, Inc., Dept. CP, Station Avenue, North Branch, New Jersey. Check CP 6972 opp. last pg.)

Viscous materials mixed better, in less time by unit's double stirring action . . .

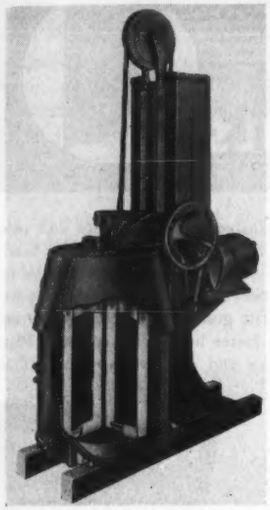
close clearances eliminate "dry" pockets, produce compressive and shearing actions

Uses: Designed to mix viscous paints, chemicals, inks, and similar materials.

Features: Double planetary stirrer results in

more effective mixing in less time. Each stirrer revolves on its own axis. Close clearances produce compressive and shearing action on material being mixed.

Description: Double motion change can mixers are available in 20, 60, or 80 gallon sizes. Can is stationary and is fitted with slide lever gate for emptying can without removal from mixer. Stirrer action assists discharge of material out gate. Jacketed cans are also available.



Schematic drawing shows double stirrers in change can mixer

Stirrers sweep close to each other and to sides of can 12 times during each complete revolution around can. Stirrers cover entire area at bottom of can. Dry or inert pockets cannot form because all parts of batch come in contact with stirrers. Mixer's raised base permits use of lift truck for moving cans.

(No. 30 DM change can mixers are product of Charles Ross & Son Company, Dept. CP, 148-156 Classon Avenue, Brooklyn 5, New York . . . or for more information check CP 6973 on the convenient Reader Service slip which is located opposite last page.)

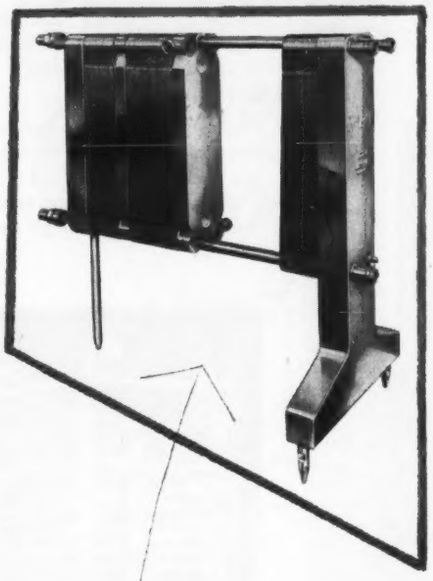
Useful reference data included on combustion equipment

Graphite combustion chambers and burner nozzles are described in eight-page catalog. Equipment's ability to burn wet gases, withstand thermal shock, and resist corrosion is emphasized, along with simplicity of design and moderate cost.

Also discussed are accessories, installation method, and operation procedure. Catalog contains engineering reference data, dimensional drawings, and installation photographs of hydrochloric acid systems using graphite equipment.

Cat S-7530 is issued by National Carbon Company, A Division of Union Carbide and Carbon Corporation, Dept. CP, 30 East 42nd Street, New York 17, N. Y. When inquiring about manufacturer's product, reader may simply check CP 6974 on the convenient Reader Service slip which is located opposite last page.

WHAT DO YOU LOOK FOR IN A PLATE HEAT EXCHANGER?



HIGH THERMAL EFFICIENCY?

In De Laval Plate Heat Exchangers the plates are so designed as to produce strong turbulence and high velocity . . . achieving maximum heat transfer.

HIGH PRESSURE RESISTANCE?

De Laval Heat Exchanger plates are made of heavier gauge stainless steel than ordinarily used . . . plate throats are pressed to provide greater strength . . . internal stress in plates is minimized by design.

PRECISION TIGHTENING?

Cap nuts on tightening bars are fitted with thrust ball bearings and thrust washers . . . clearly stamped indicating marks make it easy to tighten to same tension each day.

SIMPLE CLEANING?

The De Laval Heat Exchanger is designed for easy cleaning either by backflushing or manual washing. Unit is easily opened for inspection and cleaning.

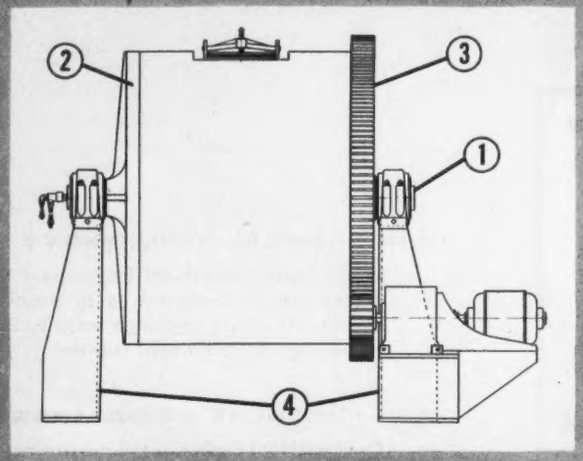
Get all the facts . . . today! Write for De Laval Heat Exchanger Bulletin.

DE LAVAL
plate heat exchangers

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 61 Beale St., San Francisco 5

When inquiring check CP 6975 opposite last page

HERE'S HOW STEVECO MODERNIZED THE BALL MILL



These outstanding design features assure quiet, efficient, trouble-free operation with less horsepower.

(1) ROLLER BEARINGS

Anti-friction, self-aligning type reduce horsepower requirements up to 25%.

(2) CAST STEEL HEADS

With integrally cast steel trunnions . . . shell welded to head . . . no leaking.

(3) MORE TEETH IN RING GEAR

2½ teeth in mesh at all times for smoother, vibration-free operation, longer life.

(4) WELDED STEEL MOUNTING STANDS

Motor base is integral part of mill stand . . . assures constant alignment.

The new Steveco mills are built in standard sizes up to 8' diameter. Get the full story on the modern line of ball mills designed to meet today's production requirements.

STEVECO

THE STEVENSON COMPANY

228 N. WILKINSON ST. • DAYTON, OHIO

Plant in Wellsville, Ohio

Sales Representatives in Principal Cities

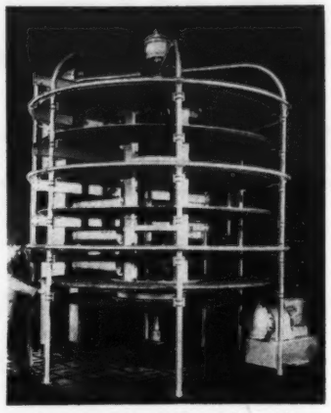
When inquiring check CP 6976 opposite last page

Reduces space required for sulfur and pitch cooling, solidifying

Uses: For continuously cooling and solidifying sulfur, pitch, similar materials.

Features: Unit's compact design reduces amount of floor space required to perform such operations.

Description: Cooler consists essentially of several circular trays (or shelves) mounted on a vertical drive shaft. Trays are cooled by water distributed through them via baffles.



Compact unit continuously cools, solidifies molten sulfur, pitch, and similar products

Molten matter passes over the shelves and cools to form a dense, thick layer. Product is transferred to breakers by stationary ramp. Crushed material discharges into screw conveyors and is carried to vertical chute from which it drops into common conveyor for transfer to storage area.

Units are available with either 10 or 13-ft diameter trays. Cooler having six 10-ft diameter trays occupies area about 16-ft square x 12-ft high. Any number of trays may be specified.

(Roto-shelf Cooler is product of Blaw-Knox Company, Dept. CP, Farmers Bank Building, Pittsburgh, Pa. . . . or for more information check CP 6977 on the convenient Reader Service slip which is located opposite last page.)

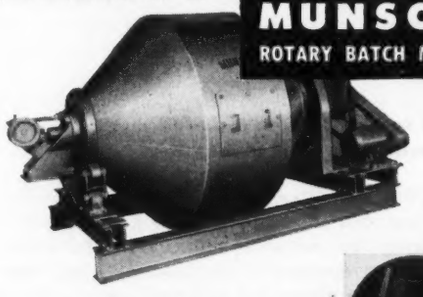
A Platecoil has more heat transfer area than a pipe coil twice its size. Thus it takes only half as much Platecoil to heat a given area. You have 50% less steel to pay for so you can save nearly 50% in initial cost. The Platecoil takes only half as much space in the tank. The greater BTU transfer per unit area of Platecoil also means faster heating or cooling. Platecoils require less maintenance and can be removed without dumping the solution.

Send for complete technical manual and descriptive Bulletin No. P54

PLATECOIL
Tranter Mfg. Inc.
LANSING 4, MICHIGAN

When inquiring check CP 6978 opposite last page

For faster, more accurate blending of dry ingredients ...make it a MUNSON ROTARY BATCH MIXER



EXCLUSIVE MULTIPLE-BLENDING ACTION

Lifters cut out and lift ingredients. Rotating cone tumbles stock. Empties *completely* after every mix.

Unequalled for dry mixing of chemicals, insecticides, powdered metals, fibrous materials, fertilizers, gelatin, glue, soap compounds, etc. Available in capacities from 20 to 250 cu. ft. Provides faster, more accurate blending, yet will not grind or reduce size of particles. Can be fitted with internal spray for introduction of limited amount of liquid.

Write for Details

MUNSON MILL MACHINERY CO.

Dept. P-555, Utica, New York

When inquiring check CP 6979 opposite last page

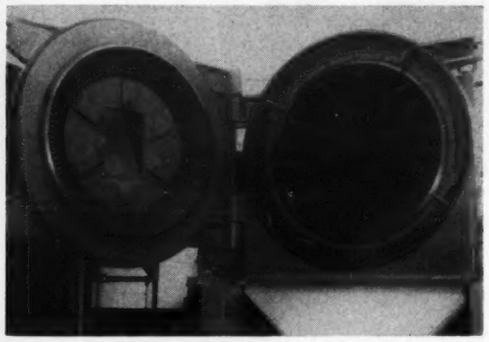
Up to 75 tons per hour processed by ricochet-action mill . . .

single-stage unit has impeller, burred plate turning at different speeds in *opposite* directions

Uses: For grinding, pulverizing, fiberizing, mixing, and blending of paints, resins, wood, rubber.

Features: Mills can process up to 75 tons per hour, depending upon fineness and material being processed. Different baffle plate surfaces are available for different operations. Simple adjustment changes particle size.

Description: Material enters mill through feed chute and is immediately flung against rough multi-edged surfaces of two baffle plates (see photo) by rotating high-speed (3200 rpm) impeller. One of the plates is stationary. The other rotates in opposite direction of impeller at 1800 rpm.



View of mill with cover plate open, showing impeller and baffle plates

Inside faces of plates contain thousands of raised, rectangular lugs, which continually expose material to striking and shearing action. The material thus ricochets between the rotating baffle plate and the stationary baffle plate, while impeller agitates the action of the material until required particle size is attained.

Ground product discharges through gap between the two plates. Particle size can be regulated by changing clearance of the adjustable front baffle plate from rear plate.

Mills are available in four sizes ranging from 1½-ft diameter weighing 2000 lb, to 7-ft diameter weighing 16,000 lb. Housing is of cast iron construction. Bearings are standard and triple seals are provided to assure explosion-proof unit.

Mill was invented in Germany in 1948. Over 1000 are being used in various industries throughout Europe.

(The Pallmann Turbo-Mill is distributed by Pall-Mann Mill and Equipment Company, Dept. CP, P.O. Box 1096, Sherman Oaks, California . . . or for more information check CP 6980 opposite last page.)

Soon...from Heyl & Patterson...

The Reineveld Centriplane

channeled to your Needs!

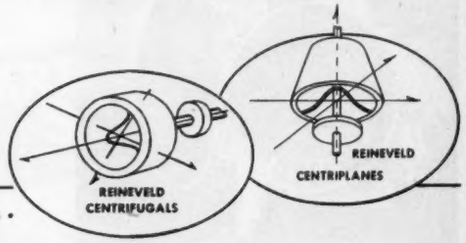
THE REINEVELD 25" CENTRIPLANE is a vertical machine which delivers the product continuously with a minimum of degradation. The machine is particularly adaptable for the mechanical dewatering of various chemical salts where large crystals are required.

The Reineveld 25" Centriplane develops 1200 G's. The resultant low moisture product means in some instances no need of Thermal Drying. And, even when Thermal Drying is considered necessary the drying cost is decreased materially.

Complete information will be available soon.

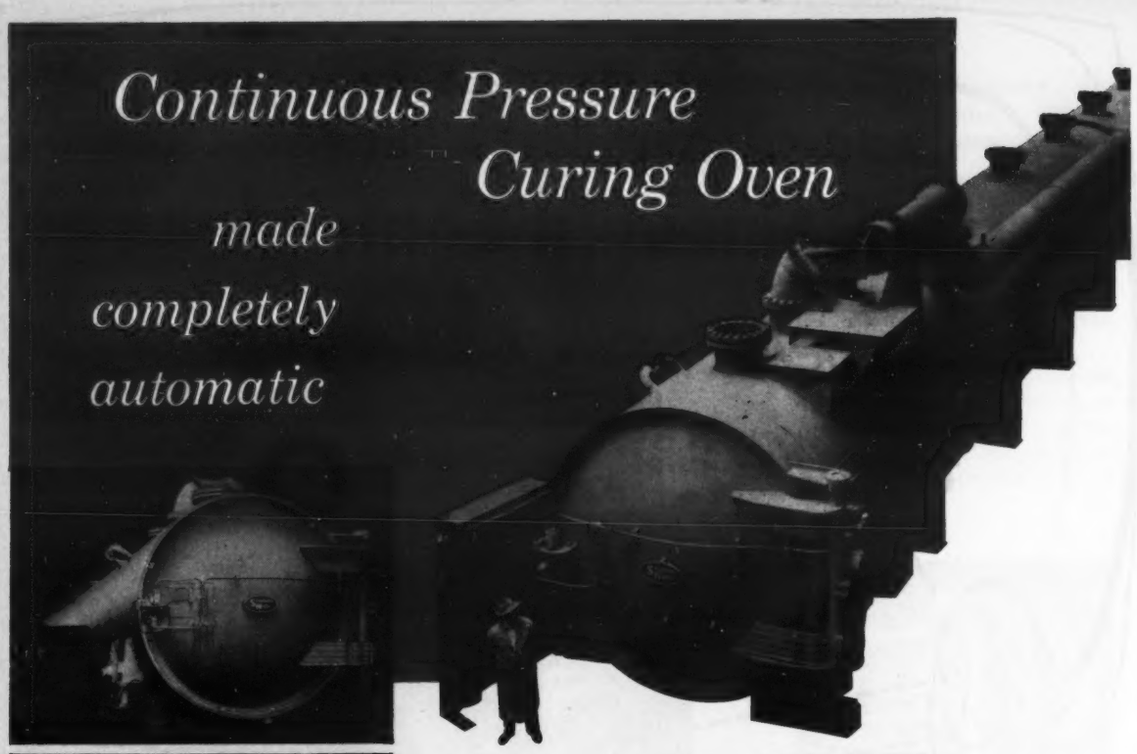
Heyl & Patterson
INC.

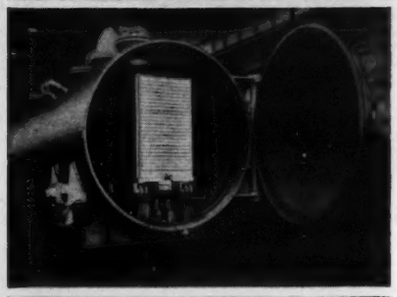
55 FORT PITT BLVD. • PITTSBURGH 22, PA.

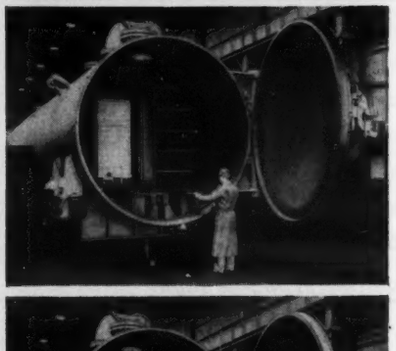


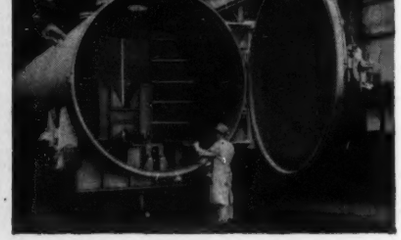
When inquiring check CP 6981 opposite last page

Continuous Pressure Curing Oven made completely automatic









with STRUTHERS WELLS

QUICK OPENING

BOLTLESS DOORS PATENTED

Carts loaded with material to be pressure cured move through this 10′ dia x 128′ long continuous pressure curing oven—by "push button" control. Doors, elevators, bridges, etc. incorporated in the design of this special purpose autoclave are hydraulically operated and controlled by solenoid-operated valves.

"Quick Opening Doors" on charging and discharging ends of the vessel require only *21 seconds* for unlatching and opening. Other automatic operations are the result of Struthers Wells advanced engineering achievements—with Quick Opening Doors providing the means for complete automation as shown in the sequence of photos illustrated at left.

Consult Struthers Wells for Quick Opening Doors best suited to your requirements.

Write for Bulletin SW-553

Struthers Wells

STRUTHERS WELLS CORPORATION

TITUSVILLE, PENNSYLVANIA

PLANTS AT TITUSVILLE AND WARREN, PA.

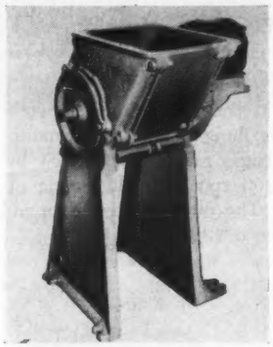
Offices in Principal Cities

When inquiring check CP 6982 opposite last page

Crushes 50-lb blocks of dry ice in less than a minute

Uses: Crushing and pulverizing large chunks of dry ice.

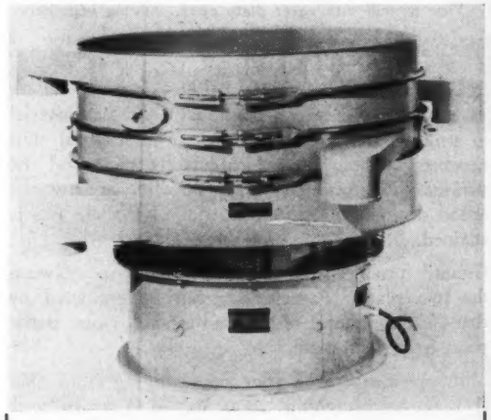
Features: Unit can crush standard 50-lb blocks of dry ice in less than a minute. Crushing size can be adjusted from ½″ to 1½″, but machine also can be set to produce an all-powdered product.



Compact dry ice crusher occupies floor space of only 20" x 22"

Description: Crusher is rugged, compact machine occupying floor space of only 20″ x 22″. Unit weighs 325 lb. It is powered by a 1½-hp motor.

(Model 301 Supreme crusher is product of Franklin P. Miller and Son, Inc., Dept. CP, 36 Meadow Street, East Orange, N.J. . . . or for more information check CP 6983 on handy form opposite last page.)



Tangential discharge spouts on vibrating-screen separator improve unit's operation. Design permits greater efficiency; higher speed is developed by material as it spirals out on screen and through discharge at frame wall. Originally separators had rectangular spouts set at right angles to screen decks.

(Sweco separators are product of Separator Division, Southwestern Engineering Company, Dept. CP, 4800 Santa Fe Avenue, Los Angeles 58, California . . . or for more information check CP 6984 on handy form, opposite last page.)

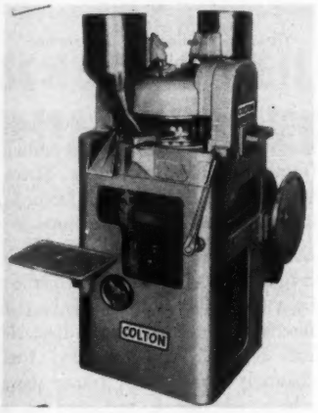
Produce 1930 tablets/min on double rotary tablet press

Uses: Produces tablets up to 5/8" diameter.

Features: Machine has capacity of 1930 tablets per minute. Front and rear weight adjustments are accessible to operator at front of machine — eliminating critical adjustment at rear station.

Description: Redesigned double rotary tablet press incorporates three-point mounting on both front and rear feed frames. This enables operator to adjust both frames, in two planes, quickly and easily.

Press has totally-enclosed, fan-cooled, permanently-lubricated ball-bearing motor. Pressure-lubricated

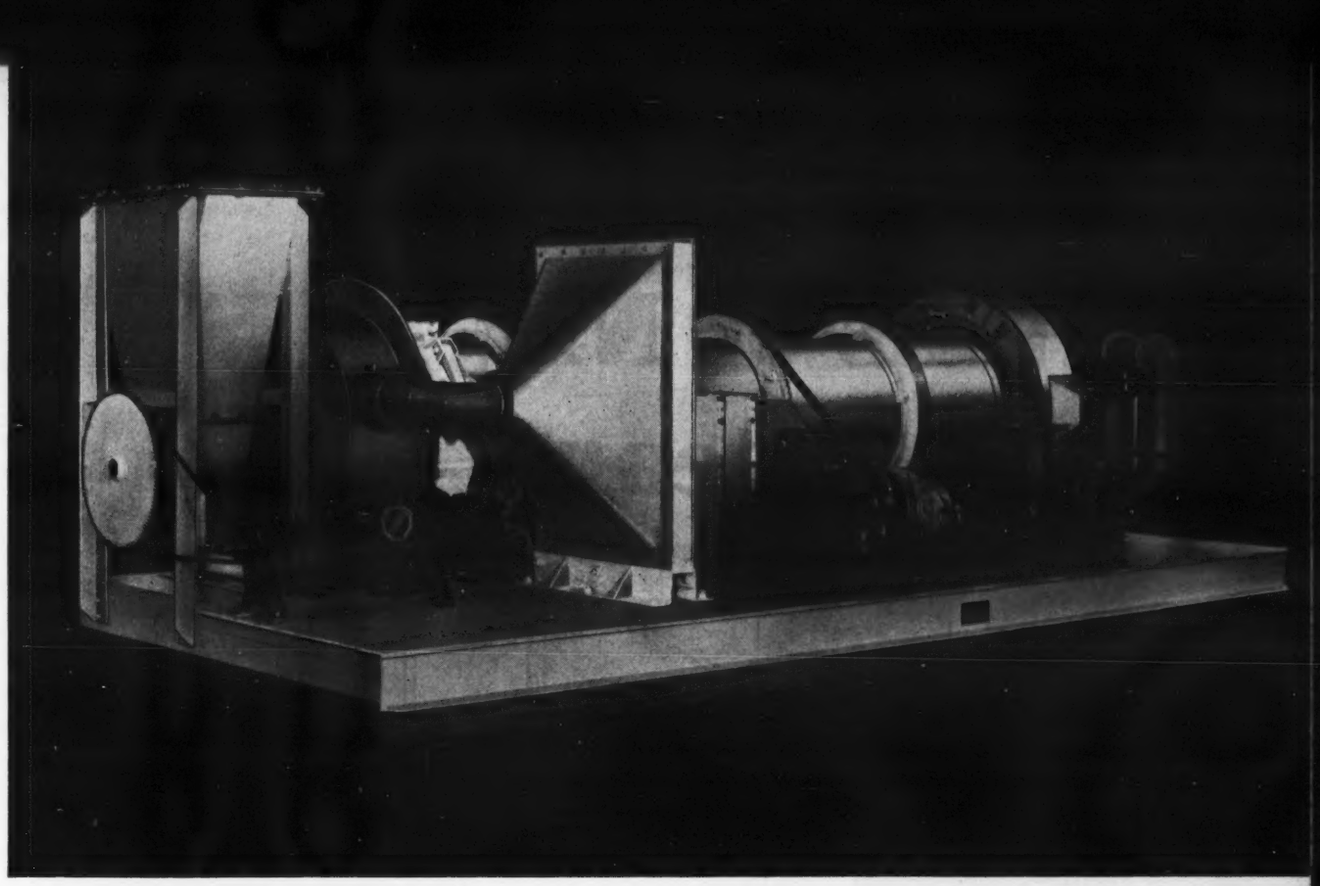


Tablet press incorporates three-point mounting on both front and rear feed frames

drive gear system is also totally enclosed — sealing it against dust incidental to tableting operations. Front and rear cast aluminum guards are designed to make die lock screws accessible.

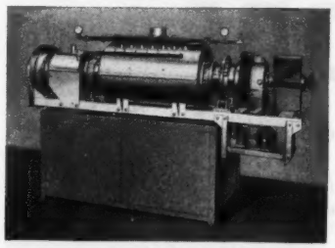
(Redesigned No. 233 double rotary tablet press is product of Arthur Colton Company, Dept. CP, 3400 E. Lafayette, Detroit 7, Michigan. Check CP 6985 opposite last page.)

For more information on product at right, specify CP 6986 . . . see information request blank opposite last page.



stainless steel **Anti-Biotic Dryer**

Rotary Cooler with Continuous Spiral Flight Permitting the Rate of Cooling to be Controlled by the Speed of Shell Rotation.



Experimental Calciner, Determines the Preferred Operating Conditions Preliminary to Building Full Size Plant Equipment.

. . . Specially designed unit removes an organic solvent from a newly developed anti-biotic— avoids product contamination.

● The drying cylinder with ground and sand blasted welds, and flights that lift the material and cascade it down through the heated air stream, present a smooth interior surface, without corners, permitting the entire interior surface to be cleaned thoroughly and quickly. Feed hopper, variable speed screw feeder, heating coils, air blower, air sterilizer, exhaust fan and cyclone dust collector are mounted on the same frame to insure permanent alignment of all parts and efficient trouble-free operation. This unit is an example of Bartlett-Snow's ability to design and build equipment that meets the most exacting requirements. Let us work with you on your next drying problem!

DESIGNERS ENGINEERS

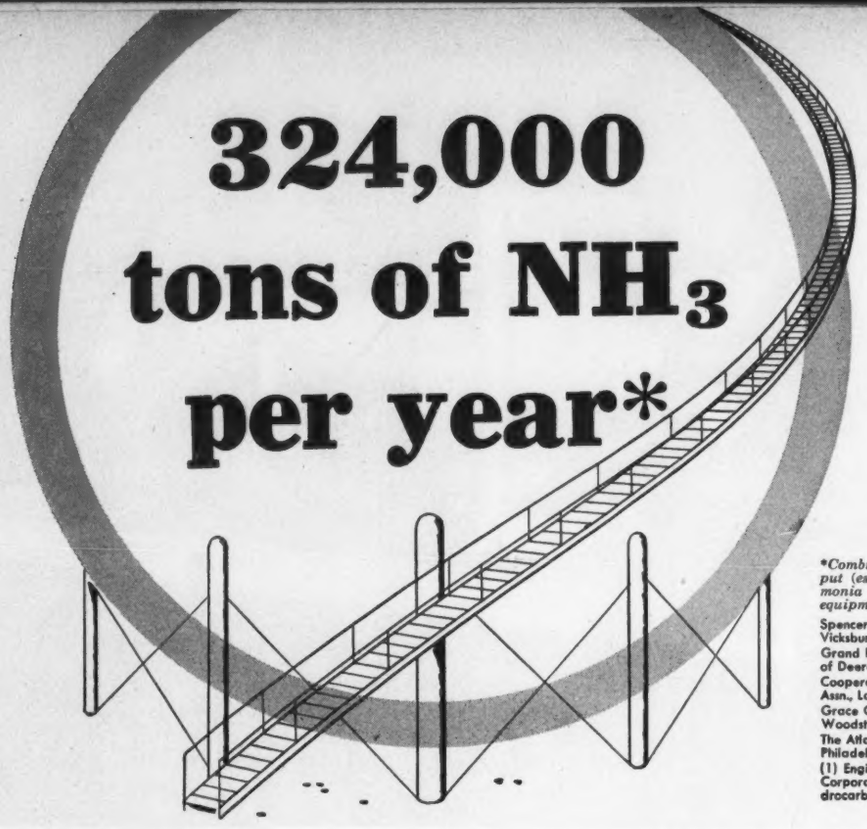
BARTLETT-SNOW CLEVELAND 5, OHIO

FABRICATORS ERECTORS

Dryers • Coolers • Calciners • Kilns

"Builders of Equipment for People You Know"

324,000 tons of NH_3 per year*



*Combined yearly capacity output (est.) of following five ammonia plants using TRANE equipment:

Spencer Chemical Company (1) Vicksburg, Miss.
Grand River Chemical Division (1) of Deere & Company, Pryor, Okla.
Cooperative Farm Chemicals (1) Assn., Lawrence, Kan.
Grace Chemical Company (1) Woodstock, Tenn.
The Atlantic Refining Company (2) Philadelphia, Pa.
(1) Engineered by Foster Wheeler Corporation. (2) Engineered by Hydrocarbon Research, Inc.

. . . in plants using Trane Heat Exchangers

Higher outputs at lower temperatures! At -300° F. Trane Brazed Aluminum Heat Exchangers are performing with superior efficiency, economy . . . dependability!

THE FIVE MODERN AMMONIA PLANTS listed above—estimated total NH3 capacity 324,000 tons per year!—are but a few of the many modern plants using TRANE Brazed Aluminum Heat Exchangers for low temperature applications.

LOWER OPERATING COSTS, plus the ability to perform efficiently and economically at temperatures as low as -350 degrees F. explain why TRANE Brazed Aluminum units are used in so many new, modern air separation and ammonia plants. Even when *large* heat transfer duties are involved, they can obtain temperature approaches of 5 degrees F. or closer. Operating costs go *down* . . . because *less* refrigeration is required to bring a specified liquid or gas to desired temperature!

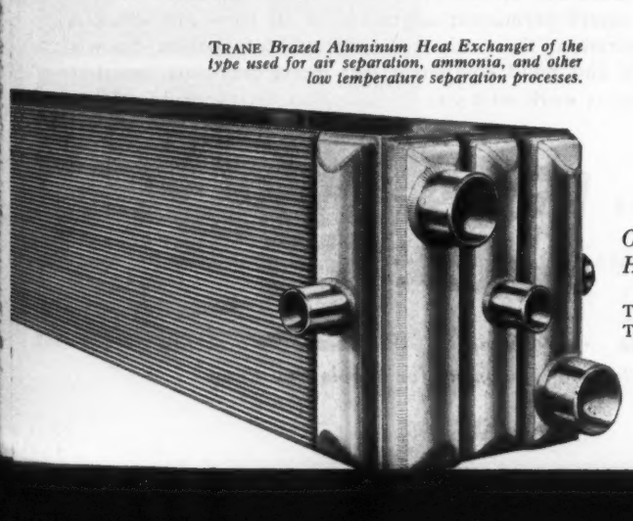
LOWER INITIAL COSTS—lower installation costs, too—are among the reasons for the steadily increasing use of TRANE Brazed Aluminum Heat Exchangers.

These compact, light-weight units pack up to 450 square feet of heat transfer surface into a single cubic foot. Units are now available for operating pressures *up to 600 psig!*

If you have a heat transfer problem involving *low temperatures, multi-stream exchange* or *close approaches,* it's time to call TRANE.

OUR 30 YEARS' EXPERIENCE in all phases of heat transfer is at your disposal. Just contact your nearest TRANE Sales Office or write on company letterhead to TRANE, La Crosse, Wisconsin.

TRANE *Brazed Aluminum Heat Exchanger of the type used for air separation, ammonia, and other low temperature separation processes.*



TRANE

MANUFACTURING ENGINEERS

One source, one responsibility for: Air Conditioning • Heating • Ventilating • Heat Transfer Equipment

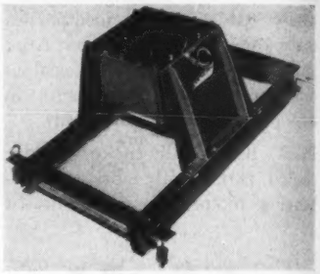
The Trane Company, La Crosse, Wis. • Eastern Mfg. Div., Scranton, Pa.
Trane Co. of Canada, Ltd., Toronto • 90 U.S. and 17 Canadian Offices

Compact vibrating screens are rugged, lightweight, and versatile . . .

dust-sealed electromagnetic vibrators featured

Uses: Screening dry materials.

Features: Screens are compact, lightweight, and ruggedly constructed, with dust-sealed electromagnetic vibrators. Units are available for cable-suspension mounting, or with triangular supporting frames for floor mounting. Screen surface can be adjusted from 33 to 40 degrees from horizontal.



Vibrator is mounted on formed steel plate bridge

Description: Cloth tension is maintained at drumhead tightness by a fixed full-width hook bar at discharge end and an adjustable bar at feed end. Welded steel channels form screen frame above which vibrator is mounted on a formed steel plate bridge.

Vibrator's moving armature rod is attached directly to cloth through bars on both side of screen surface. Rubber sealing strips prevent spillage of material over screen sides.

Screens are made for operation on 110, 220 or 440 volt, 50 or 60 cycle current. Single-deck, single-vibrator models are available in 18 x 36", 24 x 48", 36 x 60", and 48 x 72" sizes. Double-deck, dual-vibrator models are also available.

(VS Syntron vibrating screens are product of Syntron Company, Dept. CP, 110 Lexington Avenue, Homer City, Pa. . . . or for more information about manufacturer's product, check CP 6986A on handy form opposite last page.)

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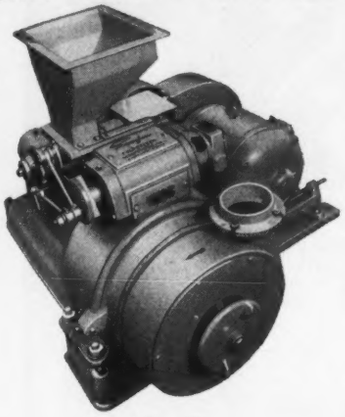
exact data. No o
Write for literature
Pulverizers.
ESTABLISHED 1893
When inq
opp

100 PULVERIZING SETUPS

From 40 mesh to 5 microns



with the

SCHUTZ-O'NEILL PULVERIZER

The Schutz-O'Neill "Superfine" Pulverizer is adaptable to the complete range of pulverizing from coarse to ultra fine. Ease of grinding and versatility of this unit are two features not found in any other pulverizer on the market. With proper adjustments, this mill will produce particles from 40 mesh to low micron sizes under conditions that enable you to accurately control not only particle size but also the size distribution in the product.

Here is a proven, automatic and dustless method of pulverizing any grindable material to your desired fineness. The principle of centrifugal impact with air attrition utilized so efficiently by the Schutz-O'Neill "Superfine" Pulverizer has been proven by more than 60 years of experience and has never been surpassed. Accessibility is excellent for change of set-up, cleaning or replacement.

We'll test-grind a sample of your stock

What is your milling problem—uniformity? fineness? increased output? lower cost? Tell us the stock you want to pulverize, fineness, capacity desired. We'll send shipping instructions. You will receive your processed product and our Engineering Test Report giving exact data. No obligation to you.

Write for literature on Schutz-O'Neill Pulverizers.

ESTABLISHED 1893

SCHUTZ-O'NEILL COMPANY

343 PORTLAND AVENUE
MINNEAPOLIS 15, MINNESOTA

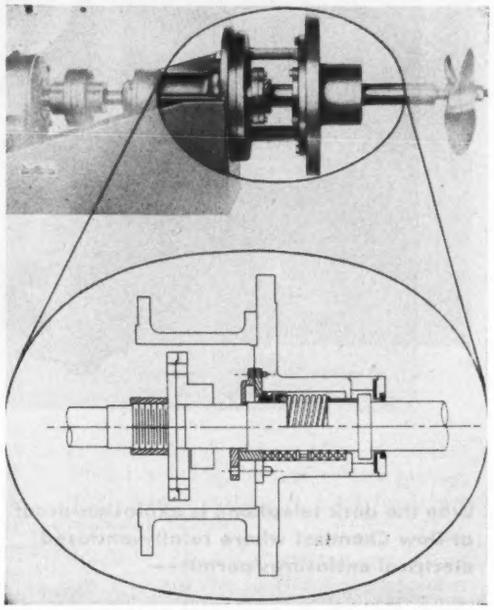
When inquiring check CP 6987 opposite last page

Pressurized mechanical seal can be repaired, replaced during use

Uses: As agitator-shaft seal for side-drive mixers on pressurized vessels.

Features: Seal can be repaired, replaced, or converted to conventional stuffing box while under pressure.

Description: Unit is designed around a Sealol-Flexibox mechanical shaft seal. The two vital elements — graphite ring and mating ring — can be replaced without disturbing balance of seal assembly. Complete unit can be replaced by conventional stuffing box under emergency conditions.



Shaft seal of side-drive mixers has secondary seal which isolates contents of tank during seal repairs

Design incorporates a secondary seal which temporarily seals off tank while mechanical seal is being serviced. Seal affords positive protection against loss of product in case of seal failure.

(Shaft seal is product of New England Tank and Tower Co., Dept. CP, 93 Tileston St., Everett 49, Mass. Check CP 6988 opposite last page.)

Facts about filter fabrics

Although booklet makes no claim to being a complete technical manual, it summarizes a number of general and specific facts about filter fabrics.

"Filter Fabric Facts" is issued by Wellington Sears Co., Dept. CP, 65 Worth St., New York.

ALL OVER THE WORLD

in the Plants of One Company

The pictures shown here are of Abbé Dispersall Mixer installations in a few of the foreign plants of a world-famous manufacturer of cosmetics. There are many more. These mixers are used in the manufacture of tooth and other pastes.

The fact that this company has adopted Abbé Dispersall Mixers for pastes in its foreign plants (as well as in its domestic factories) is ample evidence of the superior performance of these mixers.

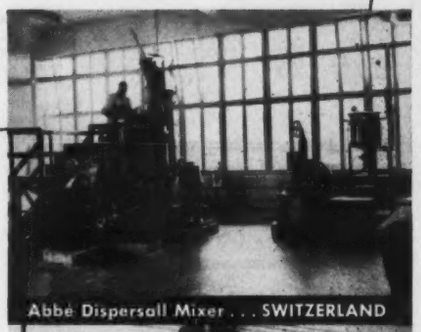
Here's What They Say About These

ABBÉ DISPERSALL MIXERS:

"They have met our requirements for a versatile piece of equipment suitable for relatively small scale production. They have the valuable quality of being easy to clean, which, as you can appreciate, is a decided advantage when more than one product is made in the same machine."

If You Are Mixing Liquids or Pastes...

ask us for a recommendation, as well as full details on the advantages of the Abbé Dispersall Mixer.



Abbé Dispersall Mixer . . . SWITZERLAND

Abbé Dispersall Mixer . . . COLOMBIA

Abbé Dispersall Mixer . . . VENEZUELA

Abbé Dispersall Mixer . . . DENMARK

ABBÉ ENGINEERING COMPANY
50 Church Street • New York 7, N. Y.
Address Department 46

When inquiring check CP 6989 opposite last page

ELLIOTT STRAINERS

DESIGNED TO GET LIQUIDS...

"TROUBLE-FREE" CLEAN

THERE'S NO CHANCE of foreign matter gumming-up your costly liquid-handling equipment when Elliott Strainers are on the job. They have proven an excellent method of removing objectionable solids from water, fuel and lubricating oil, gasoline, and in fact any strainable liquid. Backed by over fifty years of Elliott design and construction experience, these present-day strainers are servicing thousands of power and industrial plants everywhere. The line offers a great variety of types including Single, Twin and Self-Cleaning Strainers, covering pipe sizes with an I. D. of from 1" to 24". For detailed information on any or all of these strainers, call your local Elliott Field Engineer or write Elliott Company, Accessories Dept., Jeannette, Pa.

TYPE "V" TWIN STRAINER—Specially designed for lube oil, fuel oil and viscous liquids. Available sizes 1" to 8" for 125, and 1½" to 10" for 300 and 500 psi. Straining baskets available with 1/64" to 3/16" mesh.

TYPE "A" TWIN STRAINER—For water and other liquids . . . available sizes 4" to 24" for 125 psi—4" to 12" for 250 psi. Straining baskets available with 1/32" to ⅜" mesh. The twin strainer design, with one chamber always available for service, assures clear liquids on a continuous basis.

TYPE "K" SELF-CLEANING STRAINER—For removing large amounts of dirt and foreign matter in water only. Available sizes 4" to 24" for pressures from 25 to 125 psi. Straining units available with 1/32" to ⅜" mesh. Can be furnished with AC or DC motor. The power requirement does not exceed ½ hp., in the largest size.

TYPE "F" SINGLE STRAINER—For use where the flow does not contain large quantities of foreign matter, and where the strainer can be temporarily out of service for cleaning. Available in sizes from 2" to 24". Baskets available with 1/32" to ⅜" mesh. Has a single perforated basket, convenient to handle and quickly accessible.

ELLIOTT Company AS-1

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 6990 opposite last page

Even the desk telephone is explosion-proof at Dow Chemical where totally-enclosed electrical enclosures permit —

safe handling of hazardous vapors

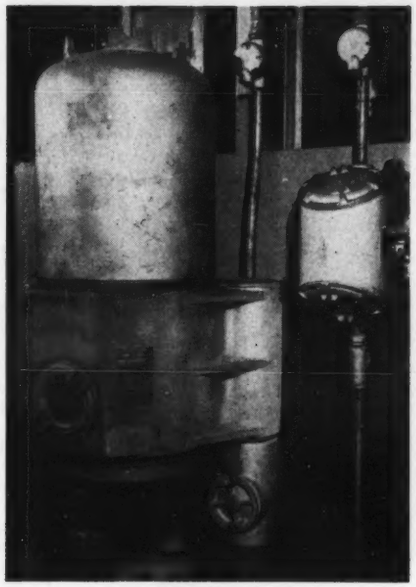
Record during past several years shows that complete safety from an electrical standpoint has been achieved in light hydrocarbon and butadiene plants

D. C. DONALDSON,
Supt. Light Hydrocarbon Dept.
T. B. Hasty, Supt. Electrical Shop
The Dow Chemical Company, Freeport, Texas
with **GORDON WEYERMULLER,** Associate Editor

PROBLEM: When the light hydrocarbon and butadiene plants were being planned at the Texas Division of Dow Chemical Company, problem of handling a number of hazardous, flammable gases had to be overcome. Materials involved included a variety of light hydrocarbons, butadiene, and other organic vapors.

Solution: Company decided to specify 100% explosion-proof electrical enclosures, even making all telephones in area explosion-proof, including one on Superintendent's desk. Light hydrocarbon plant went on stream in 1946 and the butadiene plant in 1952.

Explosion-proof lighting fixtures in compressor room

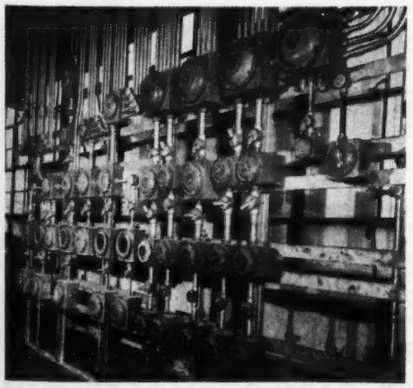


Totally-enclosed 440 volt meter for butadiene plant

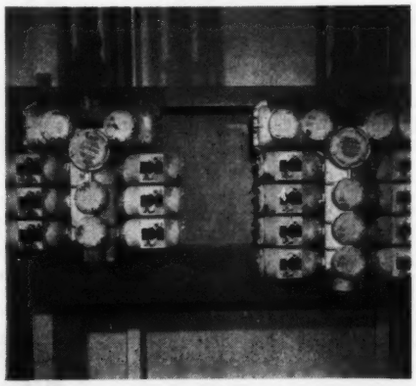
Electrical housings used have sufficient strength and close-fitting joints to withstand and confine repeated internal explosions, without igniting the surrounding atmosphere. Enclosures are not gas-tight but have a sufficient number of fully engaged threads to keep a flame from reaching the outside, while allowing cooled gases to escape.

A zinc compound mixed with petroleum jelly is used as a thread compound to prevent corrosion and for continuity of ground. A durable corrosion-resistant finish is provided by a heavy zinc plating, covered by a coating of vinyl resin base aluminum lacquer.

Results: Not a single instance of any safety hazard due to electrical equipment has occurred in spite of the flammable nature of the materials being handled. (Condulet explosion-proof enclosures are manufactured by Crouse-Hinds Co., Dept. CP, 1347 Wolf St., Syracuse 1, N.Y. . . . or check CP 6991 opposite last page.)



Relay panel for alarm, circuit, and safety switches in compressor room for light hydrocarbon vapors



Typical explosion-proof lighting panel in butadiene area

For Everlasting Protection in Emergencies

OPENING TYPE

to divert water to sprinkler deluge or water curtain systems, or to divert inflammable liquids to a point of safety.

Write for Bulletin E52C

CLOSING TYPE

to shut off the flow of inflammable liquids or to concentrate water or steam in fire mains.

Both types can be controlled thermostatically, electrically, or manually from any or many locations. Their design assures positive, dependable protection because they do not wedge and consequently cannot stick.

EVERLASTING Valves

EVERLASTING VALVE CO.

73 FISK STREET, JERSEY CITY 5, N. J.

EV391

When inquiring check CP 6992 opposite last page

for dependable, trouble-free control
"of hard-to-hold" fluids . . . . .

SPECIFY
HOMESTEAD
Lever-Seald
VALVES

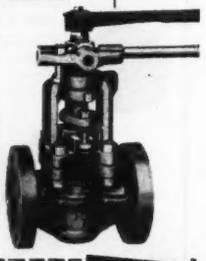
they provide sure shut-off . . .

ARE STICK PROOF . . . OPERATE INSTANTLY

A positive, drop-tight seal and instant, stick-proof operation under all fluid, temperature or pressure conditions, is assured by the exclusive, built-in, Homestead Lever-Seald mechanism. This powerful lever-and-screw device not only presses the valve's tapered plug firmly into its seat to form a drop-tight seal, but also provides a positive means of relieving seating pressure just enough to overcome friction and permit easy operation. And because all operating parts and valve seating surfaces are fully protected in both the open and closed positions from the corrosive or erosive effects of line fluids, long, dependable, trouble-free service is doubly assured.

If "hard-to-handle" fluids are your problem, specify Homestead Lever-Seald Valves for your next installation or as replacements. You'll be glad you did.

We make them in metals and alloys to specification in sizes 1¼" to 12", for pressures from vacuum to 1500 lbs., and for temperatures from 40° below zero to 1100°F. Dry seat, or pressure gun lubricated optional.



For complete details and copy of VALVE REFERENCE BOOK No. 39-3, MAIL THE COUPON TODAY.

Without obligation, send me Catalog 39-3 covering Homestead Lever-Seald Valves.

NAME_____

COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ STATE_____

HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 140 Coraopolis, Pa.

When inquiring check CP 6993 opposite last page

SAFETY

Checks flash points of distillate fuels in 2½ minutes

Uses: For checking flash points of distillate fuel at bulk distributing or storage point.

Features: No combination of failures or button pushing by an operator can force an approval stamp from machine. It is also designed to fail-safe in event of electrical, mechanical or human failures.

Checks distillate fuel flash points

Description: Flash Point tester performs the equivalent of the Tag Closed Cup Test ASTM D 56. Apparatus rejects flash points lower than selected temperature. Range of 110° to 140°F encompasses most distillate fuels but apparatus has range of 105 to 155°F.

Results of test, which can be run by driver or dock personnel, are known in 2½ minutes.

Explosion-proof construction (approved for Class 1, Group D locations) is of cast aluminum and steel. Outer surfaces are covered with baked Hammerloid enamel.

Tester comes with timeclock, gages, drain connection, and air compressor.

(Tester No. 74620 is licensed by Standard Oil Co. of Ind. and is available from Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. . . . or for more information check CP 6994 opposite last page.)

IMPORTANT SAFETY for your plant!

Slip-resistant
Tri-Lok and Tri-Forged
Serrated grating and stair treads

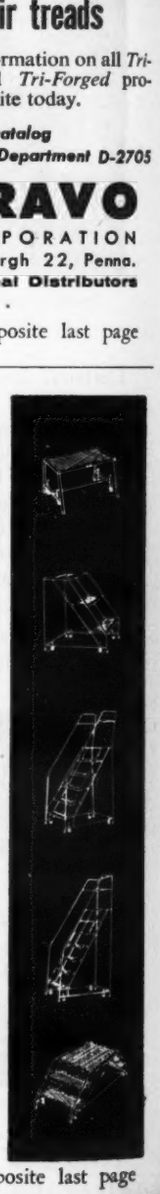
Don't take chances in those plant areas where grease, oil or other conditions make floors slippery and dangerous! Play it safe with the non-skid, notched surface of *Tri-Lok* or *Tri-Forged* serrated grating and stair treads. Here is a walking surface that is hazard-proof and the ultimate in safety. To be sure you have complete information on all *Tri-Lok* and *Tri-Forged* products, write today.

For free catalog write Department D-2705

DRAVO CORPORATION
Pittsburgh 22, Penna.
National Distributors

When inquiring check CP 6995 opposite last page

NOW... for work levels up to 15 feet high



Ballymore all-welded-steel Safety-Step Ladders available from one to twelve steps. Over 100 models to choose from. Portable—they roll. Up to 9 steps, they automatically lock to floor when you step on—9 steps and over, they have step-on brake casters at front. Send for catalog. The Ballymore Company, Wayne 10, Pa.

Ballymore Safety Ladders

Safety-Step LADDERS

When inquiring check CP 6996 opposite last page

Alarm cuts off fuel if flame fails

System uses lead sulfide cell which visually detects both gas and oil flames. Resistance of cell varies when it "sees" infrared radiation. Electronic circuit amplifies only pulsating frequency peculiar to flame radiation.

This lets system discriminate between flame and hot refractory or other sources of infrared. Main fuel valve will not open unless pilot flame has been established. System shuts off all fuel within two to four seconds following flame failure.

(System FJ-2 is a product of Combustion Control Div., Electronics Corp. of America, Dept. CP, 718 Beacon St., Boston 15, Mass. . . . or for more information check CP 6997 on handy form opposite last page.)

Protects workers' ears against high noise

Uses: To protect against high level noises which might damage workers' ears.

Features: Protector is cool and comfortable to wear and adjustable to all head sizes.

Description: Unit protects ear by covering it with a blanket of soft spongy material which soaks up large amplitude noise waves and keeps them from reaching the ear.

Keeps high level noises out and protects ears from damage

Protectors were designed on basis of extensive studies by US Air Force. Each cushion is covered with durable non-porous coating which can be kept clean by washing with soap and water.

(Noise-foe is a product of Mine Safety Appliance Co., Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. . . . or for more information check CP 6998 on the convenient Reader Service slip which is located opposite last page.)

ALLEN-BRADLEY

Six Perfection motor-driven pumps in centralized vacuum storage system for making TV color screens, equipped with Allen-Bradley Bulletin 712 combination starters which have manually operated disconnects.

STARTERS
for the
CHEMICAL
and
PROCESS
INDUSTRIES

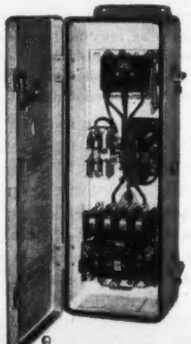
A-B Quality

The Sign of
QUALITY
MOTOR CONTROL

SAFETY FOR MAN, MOTOR, AND MACHINE

Bulletin 609 Manual Starter in NEMA 4 Watertight Enclosure.

Bulletin 709 Automatic Starter in NEMA 7 Explosion-proof, Cast-iron Enclosure.



Bulletin 712 Automatic Combination Starter in a NEMA Type 12 Enclosure for protection against dirt and oil.

When you install Allen-Bradley combination starters, you automatically satisfy the Electrical Safety Code . . . because the disconnect switch that is required ahead of the motor starter is mounted with the starter in one enclosure. In fact, these starters give you an "extra" in safety, because the cabinet cover cannot be opened unless the disconnect lever is in the OFF position. Starter and fuses are then "dead" and are safe to inspect. There are two solder pot relays which give continuously dependable overload protection.

Bulletin 713 combination starters have circuit breakers instead of manual disconnects. Both types of combination starters are available in a wide variety of enclosures, so that every service condition can be satisfied. Write for Bulletin 712-713.

Allen-Bradley Co., 104 W. Greenfield, Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

When inquiring check CP 6999 opposite last page

STEEL-GRIP SAFETY APPAREL

. . . and the Chemical Processing Industries

Steel-Grip constantly keeps abreast of developments in chemical processing, for their effect on the safety of chemical workers. And we as constantly develop new materials and new designs to counter these risks. Some of the latest Steel-Grip designs are shown on this page; they have proved extremely effective wherever they have been used.

We also believe it important to you that Steel-Grip has been designing and manufacturing a broad line of safety apparel since 1910. This has given us an enviable entree into hundreds of the largest plants of every type—an experience of untold value to any buyer or user of safety apparel. We have always emphasized quality because in our experience it gives the greatest satisfaction and value and always works out at the lowest man-hour cost of protection. Quality manufacture is standard practice here. As a result, our prices are frequently no higher than for inferior merchandise.

We manufacture a complete line of safety apparel to meet every type of need. We suggest you send for our catalog and at the same time tell us your specific needs. No obligation of course. But write today.

Amazing New

JAXCOLITE*

SAFETY GARMENTS

Amazing new compound fully tested and approved. Asbestos or duck garments coated with Jaxcolite fully protect anybody from acids, caustics, molten metal splash, heat, oil or water. Nothing to compare. Users refuse to buy anything else. Long wear. Low cost. Flexible, comfortable, good looking. Coats, pants, aprons, sleeves, leggings, spats, curtains, gloves and mitts with Jaxcolite backs.

**A product of Jaxind, Inc.*

DYNEL CLOTHING

Steel-Grip makes a line of coats, pants, shirts, laboratory coats from Dynel cloth, known to be resistant to a wide range of chemicals. Good-looking, neat, long-wearing. Will withstand many, many launderings. Special designs to order.

Steel-Grip
INDUSTRIAL
Safety Apparel

Steel-Grip manufactures a complete line of safety apparel from Jaxcolite, Dynel, Leather, Duck, Wool, Asbestos, Perma-Proof, Aluminum-coated materials, etc. for every possible safety need. No matter what you require, contact Steel-Grip Industrial. Write for catalog today.

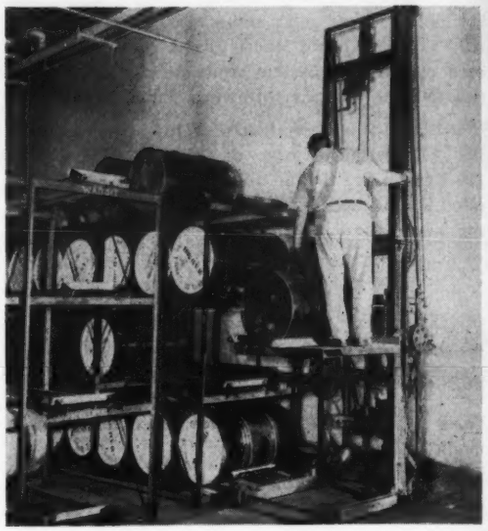
INDUSTRIAL GLOVES COMPANY
A Corporation
1690 Garfield Street, Danville, Illinois
(In Canada: Safety Supply Co., Toronto)

TO BE SURE OF THE GENUINE, DEMAND THIS TRADE MARK

When inquiring check CP 7000 opposite last page

Lifts loads up to 1000 lb in hazardous areas

Explosion-proof platform hoist is intended for use in hazardous areas. It is equipped with formica wheels and has broken-cable safety switch which prevents platform from dropping in event of cable failure.



Hoist is explosion-proof and suited for use in hazardous areas

Hoist unit, brake, overload controls and gear train are completely encased in an integral housing. All electrical fittings and controls are explosion-proof.

The 36 x 36" steel platform has lift of 12 ft, mast height 13½ ft, hinges at 7 ft.

(Model NW hoist is a product of Revolvator Co., Dept. CP, Tonnele Ave. at 86th St., North Bergen, N.J. Check CP 7001 on handy form opp. last page.)

". . . there was a loud crash and the lights went out?"

Detects minute leaks of halide gases

Uses: For locating non-combustible halide refrigerant gas leaks.

Features: Even gas leaks of minute concentration react with flame-heated copper plate in detector's chimney, causing noticeable change of color and intensity in flame.

Description: Chimney of detector is connected by brass burner and tube to a disposable steel cylinder of propane gas. Rubber search hose is attached to burner unit by flexible metal hose connection.

Fuel cylinder is self-sealing, with a neoprene washer to prevent leakage. Burner unit can be removed without any fuel leaks.

(Model TX-12 detector is a product of Otto Bernz Co., Inc., Dept. CP, 290 Lyell Ave., Rochester, N. Y. . . . or for more information reader may simply check CP 7002 on handy form opposite last page.)

Firefighting hood takes 2500°F radiant heat

Lightweight protective hood has been developed which withstands radiant heat up to 2500°F.

Hood is made up of metallic layers and an outside coating of aluminum foil. It is spacious enough to permit wearing of standard breathing equipment or smoke mask. It is constructed to be worn over a standard skull guard.

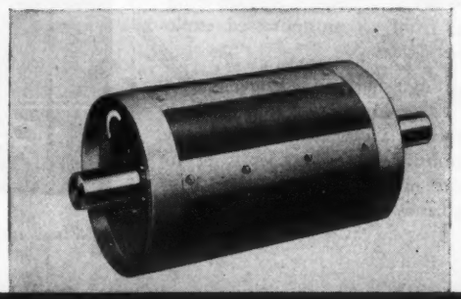
(Hood is a product of Far-Ex Corp., Dept. CP, 75 West St., New York, N.Y. . . . or for additional information check CP 7003 on handy form opposite last page.)

For more information on product at right, specify CP 7004 . . . see information request blank opposite last page.

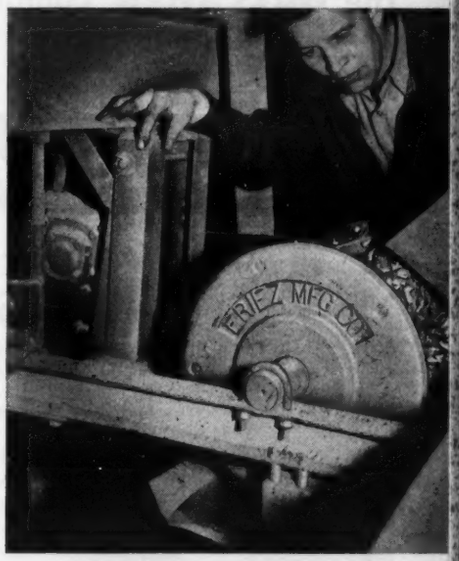
OLD IRON PANTS AND THE MAGNET! A lady from yesterday with a metal-ribbed girdle wouldn't be safe next to an Eriez Permanent Magnet. She might easily be "hung up" by the powerful Alnico V action. This idea of herculean power is practically applied in industrial processing lines. Magnets convey and control metals, and remove dangerous tramp iron preventing fires, machinery damage and product contamination. *All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments. Best of all their magnetic power lasts a lifetime. The first cost is the last.*

MAGNETIC IDEAS FROM ERIEZ

ERIEZ PULLEY WATCHES YOUR BELTLINE. The idea of this Eriez Magnetic Pulley is to reduce tramp iron . . . tramp iron which is hidden in wet or dry material passing on conveyor belts of rubber, leather, canvas, stainless steel, etc. Pulley sizes range from 4" to 30" diameter, in belt widths from 4" thru 72". The rugged construction and powerful magnetic strength of Eriez Pulleys give you trouble-free operation and efficient protection against tramp iron damage to costly crushers, grinders, pulverizers, stokers, etc. Want more information on this product? . . . request Bulletin 501.



ERIEZ GRATE MAGNET DOING SWEET JOB. *Purity* is the watchword at Boweys, Inc., Chicago concern making quality chocolate powder and syrups. Fine iron contamination and an occasional nut or bolt (tramp iron) could cause product contamination and damage the mills that grind to extremely close tolerances. To protect both product and machinery, an Eriez Permanent Grate magnet was installed in the feed hopper of a Raymond mill. It has proved very efficient; the foreman insists he would not run his mills without it. Eriez Grate magnets are so successful at removing fine bits of metal from free-flowing processing lines, that a recent quality-control test by an independent laboratory showed a single Eriez magnet removed 93% of 100-200 mesh iron.



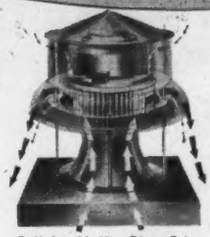
ERIEZ DRUM MAKES BORING JOB PAY OFF. W. F. Jobbins Co., Aurora, Ill., recently solved a problem that was both expensive and troublesome. Valuable aluminum chips were being lost in iron tailings. Previously, the tailings were collected during the week and re-run on a double deck separator on the weekend, in order to salvage the aluminum from the waste tailings. Now, with an Eriez Permanent Magnetic Drum, the tailings are so free of aluminum there's no need to re-run them. This process saves 4 to 8 man hours daily. The magnet functions so efficiently, the company reports, that loss of aluminum to iron tailings is less than lab figures show it should be! Want to know what an Eriez Drum can do for you? Request 6-page Bulletin B-601.

ERIEZ

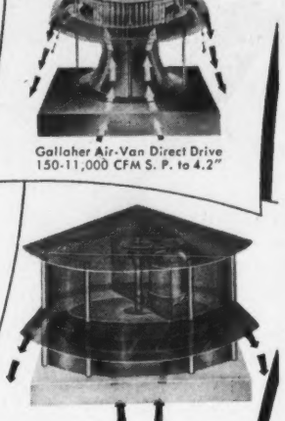
Eriez "Magnetic Ideas" can help you. Eriez' factory-trained field men, backed by Eriez' laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey and offer helpful "Magnetic Ideas". Write or call Eriez Manufacturing Company, 735 Magnet Drive, Erie, Pa.

In addition to having the motor out of the airstream, fresh clean air is constantly drawn through the motor hood creating an air curtain around the motor shaft which absolutely prevents fumes from entering the housing while the unit is in operation.* This eliminates most special winding motors.

Where high slot speeds must be maintained Gallaher Air-Vans with patented scroll effect design are generally the answer. Design research has shown that without this feature efficiency against even ¼" S.P. is impossible. Gallaher units develop up to 4" static pressure and 65,000 CFM. Ratings have been certified in an independent laboratory under the direction of a nationally recognized authority.



Gallaher Air-Van Direct Drive 150-11,000 CFM S. P. to 4.2"



Gallaher Belt Drive 5,000-65,000 CFM S. P. to 4"

Other features include low silhouette, weatherproof design, low noise levels, and availability in special metal and finishes, shipped as a complete package ready for installation. *patented exclusive features.

The GALLAHER Company

4108 Dodge Street **Omaha 3, Nebraska**

When inquiring check CP 7005 opposite last page

Large "Kwikleen" slide valve with chain wheel control; has removable bottom plate and a hose connector for quick cleanout of accumulated solids by air, steam or water.

Fabricated aluminum slide valve with rectangular opening.

The full flow area, easy control and shut-off features of these W. S. Rockwell Slide Valves (Blast Gates) make them dependable units for pipe lines and processing equipment. They are made in any required metals, in 1" to 24" pipe size, with manual or automatic operators, to meet any required operating conditions.

Relatively low in first cost, easy to install, rugged, efficient, compact.

Write for Catalog.

W. S. ROCKWELL COMPANY

ROCKWELL SINCE 1888 BUILT

BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

When inquiring check CP 7006 opposite last page

Sees explosion — snuffs it . . .

detects explosion by responding to its infrared output

Explosion extinguisher is designed to prevent explosions in ground fuel storage tanks, pumping stations, and similar areas.

Heart of device is miniature photo-conductive cell. This cell detects explosion by responding

Explosion extinguisher system consists of speed-of-light detector and complete electronic control in 5" cylindrical housing. Plastic capsule contains detonator and extinguishing fluid

to its infrared output the instant it "sees" it.

This response requires no flame contact, pressure rise, or temperature rise. *Speed of detection of explosion can be within one-millionth of a second of ignition.*

Coupled with cell is explosive capsule containing a liquid extinguishing agent.

Cell responds to the infrared radiation of incipient explosion by counter-exploding frangible capsule and flooding area with extinguishing liquid.

This sequence extinguishes explosions with little or no pressure rise instead of the several hundred pounds of pressure normally resulting from an unsuppressed explosion.

(Extinguisher unit is a development of Fireye Div., Electronics Corp. of America, Dept. CP, 77 Broadway, Cambridge 42, Mass. . . . or for more information check CP 7007 on handy form opposite last page.)

Safety **GRIP-STRUT** Pat. Pending

NON-SKID—RUGGED—LOW COST

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe.

Write today for new catalog showing loadings and methods of easy application in your plant.

Distributors in all principal cities.

GRIP-STRUT division

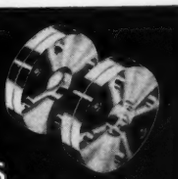
THE GLOBE COMPANY

Manufacturers since 1914

4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 7008 opposite last page

Insure...



POSITIVE PROTECTION FOR PRESSURE SYSTEMS WITH FRANGIBLE DISCS

The Engineered "Safety Factor"

CHECK THESE IMPORTANT FEATURES:

- *FULL PIPE SIZE RELIEF OPENING . . . Disc breaks in several lobes without fragmentation.*
- *VERSATILITY . . . Use FDI discs and assemblies anywhere in your piping system. Made from most metals and supplied with chemical-proof coatings.*
- *WIDE RANGE OF PRESSURE AND TEMPERATURE PROTECTION . . . Designed to rupture from 5 psi to 5,000 psi or higher on special order.*
- *LOW MAINTENANCE COSTS . . . No moving parts. Slide the retainer ring out, replace the disc and re-install. Simple, easy and economical.*

Send Today For Our Free Catalog

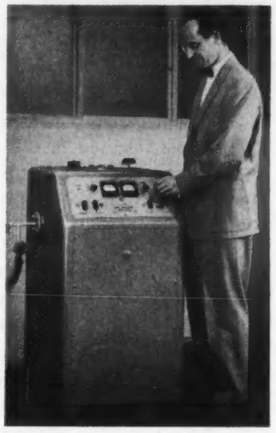
Frangible Discs, Inc.

Penns Grove, N. J.

When inquiring check CP 7009 opposite last page

One part helium in two million enough to trigger detector for small leaks . . .

capable of finding leaks so small that only a thimble full of gas could escape in 300 years



Sensitivity of leak detector makes it capable of detecting one part helium in two million parts of air. This sensitivity is ten times that of manufacturer's standard unit designed for usual leak applications.

A simplified mass spectrometer, detector is sensitive to minute traces of inert, non-contaminating helium. Helium passes through smallest leaks in parts, equipment, or systems under test. Sensitivity of this device makes it capable of detecting a leak so small that only one thimble full of helium would pass through it in 300 years.

Instrument features rapid response. It has a special balancing circuit for cancelling out effects of residual helium without affecting sensitivity. Flashing pilot light is a safety feature giving instant indication of operational failure. Rate of leakage is indicated directly on a meter at control panel. Audible alarm has a varying pitch to roughly indicate magnitude of leak. Detector is powered from 115v 60 cycle AC and is mounted on casters for easy mobility. Line of accessory probes, calibrated leaks, etc, is available.

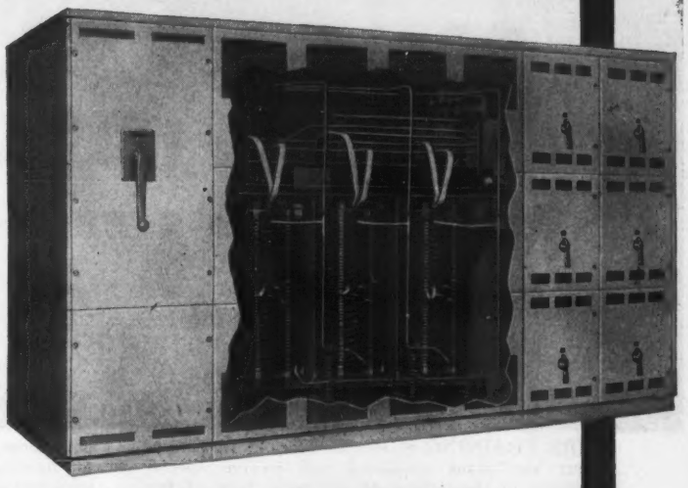
(Type 24-110 Leak Detector is a development of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information check CP 7010 on handy form opposite last page.)

Describes way to check fuel flash points

Illustrated eight-page bulletin points up safety and time saving features of an automatic flash point tester used to check distillate fuel at distributing and storage points.

Bul 720 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 7011 on handy form opposite last page.

Wagner®
TRANSFORMERS
. . . the choice of leaders in industry



No matter what your load-center requirements . . .

you can specify a

Wagner

SUBSTATION TRANSFORMER

***PREDESIGNED* to meet your needs**

✓ **save shipment time . . .**

✓ **save job engineering costs . . .**

✓ **get full Wagner Quality with switchgear of your choice**

Wagner "Predesigned" standard unit substation transformers are carefully engineered to meet *heavy* industrial demands—they are not designed for minimum duty only. Predesigning completely eliminates individual job engineering time . . . reduces your costs . . . and permits quick delivery.

When you specify Wagner "Predesigned" transformers you get the advantages of a proved design in a completely assembled transformer, tested at the Wagner factory. They are built in standard ratings which are coordinated with the specifications of all unit substation builders.

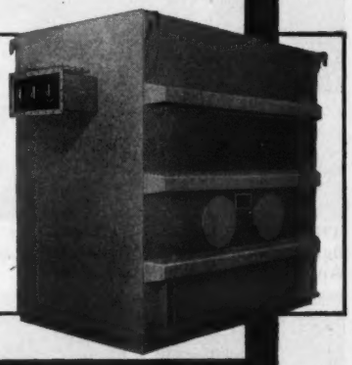
Wagner builds a complete line of substation transformers—open, ventilated Dry-type, Oil-Filled, Noflamol, and sealed-dry-type Nitrogen Filled—in ratings from 112½ through 2000 kva, 15 kv and below, to handle practically any distribution requirements.

You can specify the Wagner Transformer that exactly meets your load-center distribution requirements—be assured of full Wagner Transformer Quality—and gain a substantial advantage in delivery time and in cost.

Investigate the many advantages of specifying Wagner "Predesigned" Unit Substation Transformers for your next load-center installation. Consult the nearest of our 32 branches offices, or write for Wagner Bulletin TU-205. It gives full information on Wagner Unit Substation Transformers for industrial power distribution systems.

SEALED-DRY-TYPE NITROGEN FILLED

Wagner's nitrogen-filled transformers offer many advantages in maintenance and safety. They are relatively unaffected by water—they require only a minimum of maintenance—they present no cleaning problems, even in dust-filled areas. They have exceptionally high overload capacity, and are completely fire and explosion proof. Available in ratings up to 2000 kva.



Wagner Electric Corporation EST. 1891

WAGNER ELECTRIC CORPORATION
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

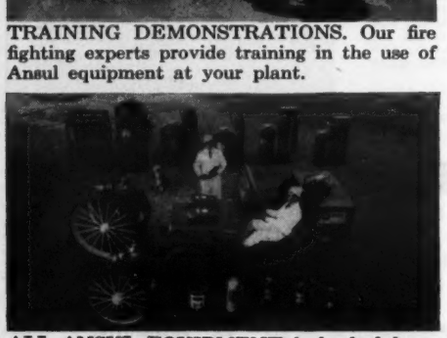
T55-1

When inquiring check CP 7012 opposite last page

FIRE TRAINING SCHOOL. Here at Marinette your key plant personnel will receive special training in the proper use of every type of fire equipment. They will learn the basic techniques for fighting every kind of fire. This is the best equipped private fire training school in the nation.

There is no need to accept less than Ansul's complete fire protection program!

TRAINING DEMONSTRATIONS. Our fire fighting experts provide training in the use of Ansul equipment at your plant.



ALL ANSUL EQUIPMENT is backed by a five year warranty, your assurance of fast, effective fire protection.

Experience can be a grim teacher. It has taught many a businessman that you need a *complete* fire protection program to guard against ruinous fire damage. You need *fast, effective equipment,* plus *trained personnel* to man that equipment. Ansul offers *both* and at no extra cost. Get in touch with the Ansul man, he has the story about *complete* fire protection.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Dept. F-122, Fire Equipment Division, Marinette, Wisc. Write Ansul for your copy of new Fire Equipment Catalog.

ANSUL

When inquiring check CP 7013 opposite last page

Lens material of compounded resins stands up well under impact and pierce tests . . .

material weighs only half as much as safety glass but has twice the strength

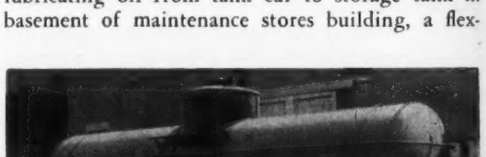
Tests recently conducted to determine pierce and impact resistance of a new lens material of compounded resins have shown that material offers excellent protection against both these hazards.

In test, pencil-shaped bar weighing 44 grams with steel needle inserted in the end, was dropped 87" in a tube by trigger control, onto apex of lens at rate of 6.5 mil/sec. No specimens of lenses made from the compounded resins fractured after a series of tests. On the other hand, every specimen of safety glass of equal thickness shattered and broke. New lens material has only half the weight but twice the strength of safety glass.

(Optilite lenses are a product of United States Safety Service Co., Dept. CP, 1215 McGee St., Kansas City 6, Missouri . . . or for more information check CP 7014 opposite last page.)

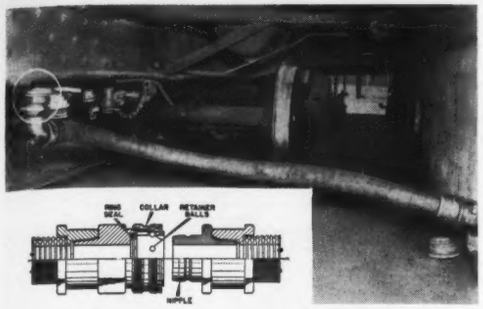
Makes tank car unloading faster and safer

Unloading tank cars is faster and safer at U. S. Steel Corp.'s Homestead District Works since introduction of snap-on hose couplings. To feed lubricating oil from tank car to storage tank in basement of maintenance stores building, a flexible hose is connected from discharge fitting on underside of car to inlet fitting in wall of building.



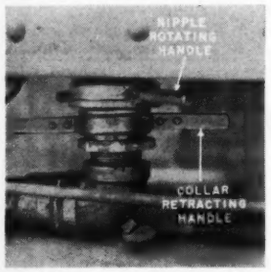
Arrangement for unloading tank car shipments of lubricant at U. S. Steel Co.'s Homestead District Works. Lubricant is piped directly from tank car into storage tanks in basement of maintenance supply building. Discharge piping connection (circle) is leak-proof to prevent slipping and fire hazards created by oil leakage near supply building

Former practice was to connect this hose by a threaded coupling. This meant using a large wrench in restricted space below tank car. This required two men; one to hold the hose, the other to do the tightening. Since sealing action in



Close-up of coupling arrangement for connecting hose to tank car discharge fitting. Coupling (circle) requires no tools to connect and can be connected by one man in a few minutes. Threaded coupling required one man to hold hose in place while another screwed on coupling. Inset shows construction

threaded coupling is produced by two flat metal surfaces in tight contact, threaded coupling had to be screwed up extremely tight. Oil leaking would make space near building slippery — a serious safety hazard.



Handles on coupling nipple are for tightening without use of wrench. Handles on coupling collar facilitate retracting spring loaded collar to connect or disconnect coupling

With the new snap-on couplings, one man does all the connecting. This operation, which used to take two men half an hour, is now done in a few minutes.

Collar arrangement in this coupling permits a full swiveling action. That is, neither end of coupling has to be twisted to connect or disconnect coupling. This eliminates hose kinking, one of the actions which generally causes hose to wear out quicker.

(Quick Seal Couplings are a product of Titeflex, Inc., Dept. CP, Industrial Sales Div., Ten Hendee St., Springfield 4, Mass. . . . or for more information reader may simply check CP 7015 on handy form opposite last page.)

Have a safety problem . . .?

the handy Product Directory (pages 214 to 217 in this issue) is your guide to equipment and ideas which may suit your needs.

FAN-EATING FUMES NEVER TOUCH METAL

IN "BUFFALO" RUBBER-LINED EXHAUSTERS

RUBBER WELDED TO STEEL

It's not a "new" idea — "Buffalo" Rubber-Lined Exhausters have been saving money on corrosive fume jobs for over twenty-five years — lasting anywhere from three to twelve times longer on the job than ordinary steel plate exhausters. And it stands to reason — for fumes passing thru these fans contact nothing but rubber, vulcanized to every square inch of the wheel, hub and housing. Savings in fan replacements more than pay for the additional cost of the rubber lining, to say nothing of the reduction in shutdown time. "Buffalo" fans are also available with other coatings and of special metals to resist corrosion. This is just another example of the "Buffalo" "Q" Factor* that saves you money and troubles with every "Buffalo" Fan you buy.

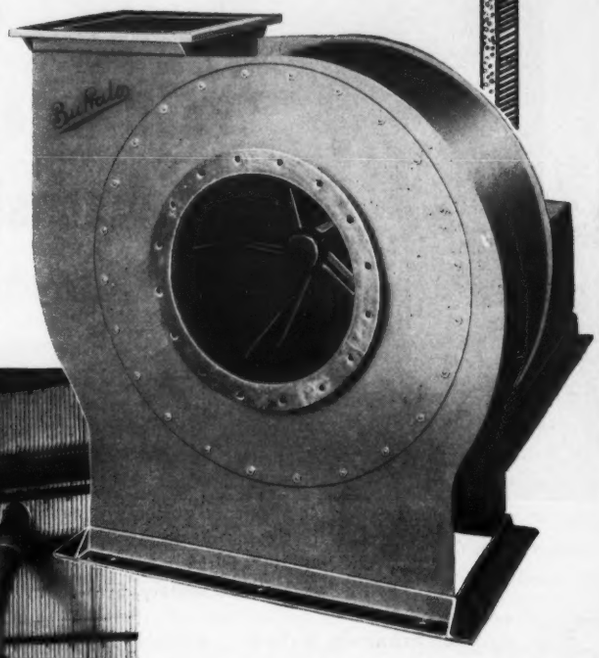
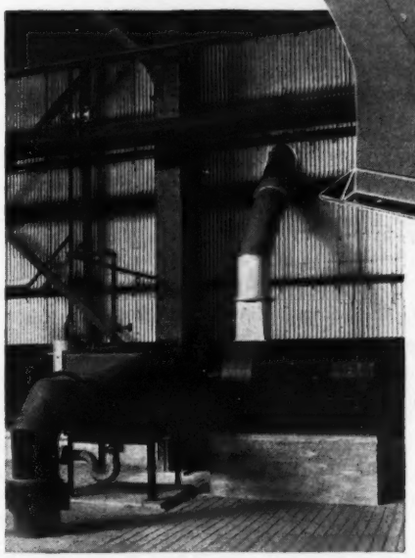


Diagram at top shows how interior surface of fan is covered with layer of rubber vulcanized to the steel.



"Buffalo" Rubber-Lined Fan and Gas Scrubber in a steel mill.

**The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.*

WRITE TODAY FOR BULLETIN 2424-F

BUFFALO FORGE COMPANY

524 BROADWAY BUFFALO, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

"Buffalo"

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

When inquiring check CP 7016 opposite last page

Your newest employee

can determine viscosity!

Flip the Switch, Read the Dial
BROOKFIELD Synchro-Lectric Viscometers
Do the Rest, Accurately, Swiftly

Now, even non-technically trained lab or process personnel can determine viscosity — from 1 to 32 million centipoises of almost any Newtonian or non-Newtonian material at any temperature. In one glance, the Brookfield dial tells the story accurately . . . even viscosity changes as small as 1/5th of 1%.

Brookfield Viscometers are portable, can be used anywhere, and are available in four, and eight-speed models. The complete line of Brookfield accessories, U. L. adapters, and Helipath stands, for example, make Brookfield Viscometers adaptable to any problem . . . vital equipment you should know about! Complete information is yours without obligation.

Write, wire, phone, or clip and mail the handy coupon below. Do it today.

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON 36, MASSACHUSETTS

Send The Facts To:.....

.....

When inquiring check CP 7017 opposite last page

for the laboratory

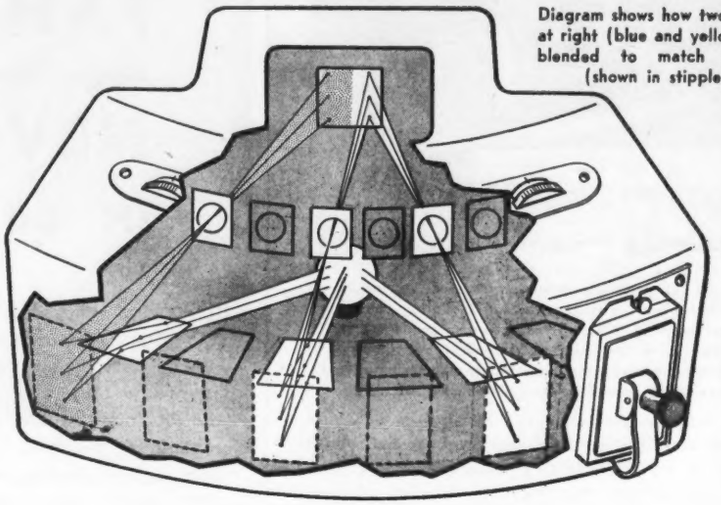


Diagram shows how two colors at right (blue and yellow) are blended to match sample (shown in stipple)

Gelatin capsule color was hard to check with fading color standards. Now . . .

color checks take ⅓ less time

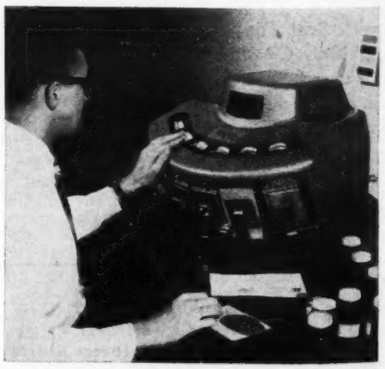
. . . and porcelain color standards leave no doubt

Problem: R. P. Scherer Corp. of Detroit was not satisfied with color control in the production of gelatin capsules. Gelatin-coated plaques were made up for comparison to color standards. Visual judgment did not seem to be at fault, but standards (made with dye) often faded beyond usefulness in two weeks. Even when fairly new, there was a tendency to distrust standards.

Solution: Reliable standards are now used with a colorimeter. Standards, made of porcelain enamel on steel, cannot fade in normal service. Colorimeter itself is so constructed that light from sample is projected on left half of a pure white magnesium carbonate screen. Light from series of standard color plaques (standards) is mixed and thrown on right half of screen. Amount of each color can be controlled by shutter until both sides of screen match.

Instrument's optical system is so designed that only diffuse light from sample and standards reaches screen. Effects of gloss and texture are eliminated and appearance is that of sample and standard side by side.

Six color comparison stations are provided—



Varying amounts of primary colors are blended to produce standard color by adjusting dials

Sample is taken by dipping a plaque into molten gelatin. When it has dried it can be put right into colorimeter for reading

two for sample and any color used to dilute it, four for standards and white. These are lighted from a 400 watt tungsten lamp. Shutter with graduated 0 to 100% scale is used to uncover standard. Reproducible reading is a "formula" for color.

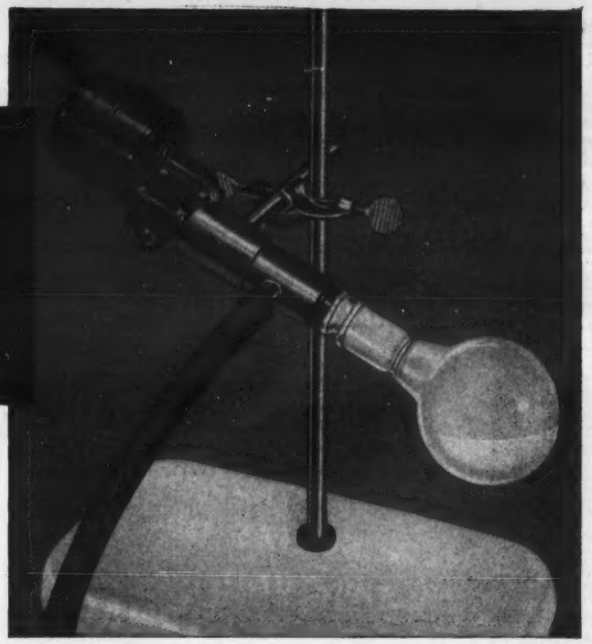
Results: Color matches can be made consistently within 1 or 2%. Permanent standards have completely eliminated problems of constant color — there is no fading so gelatin color is held constant week to week.

(Davis-Bruning Colorimeter is a product of the Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 7018 on handy form opposite last page.)

There's an easier way . . .

. . . to locate reagents, laboratory specialties, and equipment you want to know about. Product Directory starting on page 214 of this issue will tell you where to find information you need.

for rapid evaporation of solvents of low volatility



Use

THE

RINCO ROTATING VACUUM-TYPE EVAPORATOR

(Patent Applied For)

● For speeding up routine evaporations. Handles volumes from 1 c.c. to 1000 c.c. Principle utilized — rotation of flask spreads out thin film over large area (diameter of flask) subjected to negative pressure. "Bumping" eliminated. Use of glass beads unnecessary. Rate of evaporation increased 4 to 5 times, depending on solvent used. Particularly advantageous with such solvents as water, dimethylformamide, etc. 30 ml. of water at 20° C will be evaporated in 30 minutes or less. Very useful with heat sensitive compounds and biological extracts since no temperature increases are necessary. Evaporator will, of course, operate satisfactorily at higher evaporation rates with increased temperature, when sample characteristics permit application of heat.

Evaporator consists essentially of a stainless steel shaft with a machined Standard Taper 19/38 joint at lower end. Shaft rotates on oilite bronze bearings within stainless steel housing having Standard Taper 12/30 take-off leading to vacuum pump or aspirator. Vacuum pump and trap are recommended for best results, but can be used with aspirator. Flask attached to Standard Taper joint at lower end of shaft rotates at approximately 60 r.p.m. by means of special motor. Standard Taper 19/38 joint accommodates smaller capacity flasks, i.e., 50 ml. H-63620 Reducing Adapters, Pyrex Brand Glass, permit use of larger flasks having Standard Taper 24/40, 29/42, etc. Entire apparatus can be easily disassembled for cleaning.

Note: Support stand, clamp and glassware are accessories and may be ordered separately.

Can be adapted to single or multiple units.

H-21655 — Rinco Rotating Vacuum-type evaporator complete with motor and cord for use on 115V 60C, A.C. . . . **$96.50**

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DIVISION OF THE HARSHAW CHEMICAL CO.
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Jackson & Swanson Sts.

When inquiring check CP 7019 opposite last page

Type 70-T
Temperatures to 1950° F.

The new design of these furnaces provides you with a complete and compact self-contained unit. The base contains a tap-changing transformer equipped with two selector switches which offer 36 steps of temperature control. Larger size tube Furnaces are available. Write for Bulletin 552.

Type 123-T

Each Section Separately Controlled

This Organic Combustion Tube Furnace, made in three movable sections, is a convenience for the modern organic analysis laboratory. This furnace can act as one or as three separate units. The use of tap-changing transformers allows closer temperature regulation and means savings in power and maintenance. The furnaces are hinged for easier operation. Write for Bulletin 735R.

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

When inquiring check CP 7020 opposite last page

FOR THE LABORATORY

Fractionates gases quickly using adsorption

operation is based on chromatographic action — analysis is recorded

Uses: Makes recorded analyses automatically and quickly. Typical applications include natural gas, gasoline plant gases and liquids, refinery gases, liquefied petroleum gases, synthetic rubber intermediates, pertochemical gases.

Features: Almost completely automatic, analysis is reported to be two to three times faster than other methods.

Description: Gas separations are made by fractional adsorption in a tapered column. This is filled with active granular adsorbent. As sample passes from bottom to top, segregation occurs with heavier components remaining toward the lower part of column.

Displacement gas has higher affinity for adsorbent than any of components in sample. This is fed into bottom of column at a controlled rate. Sample is displaced and rises through bed. Separation occurs as sample moves up with light gases shifting to top, heavy gases tending to remain toward bottom. As fractions emerge from top of column they enter thermal conductivity cell for identification. Cell positions pen of a constant balance recorder.

Unit is housed in a single cabinet about seven feet tall. This contains gas handling tubes, recorder, accessory equipment. Sample size is about 300 to 350 ml, though samples to 16 liters can be handled if necessary. Analysis time runs from ¾ of an hour for light components to as much as 3 hours for heavy ends of a wet gas. Typical performance with LPG is about 1 to 1½ hours. With proper technique LPG can be run through as quickly as 20 to 30 minutes.

(Fraction gas analyzer is a product of Burrell Corp., Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. . . . or check CP 7021 opposite last page.)

LP gas in disposable tank serves as fuel supply for portable burner

Uses: As a laboratory heat source where gas piping is not available. Portable unit may be used for field work.

Features: Burner uses disposable tank of liquefied petroleum gas as fuel source. Wire cradle permits burner to be operated at any angle.

Description: Unit has all-brass burner, control valve, and fittings. Burner is designed for use

CRUSH ROSINS
RESINS OR MALEIC ANHYDRIDE to Speed Processing

Takes Full 50 lb. Cake

FOR THE CRUSHED SIZE YOU NEED
You get the maximum percentage of desired nodules at the size required with minimum of unusable fines. Larger capacity machine available. *Can be supplied to produce 100% Powdered Dry Ice Snow.*

USERS OF SUPREME DRY ICE CRUSHERS
Drug Manufacture, Meteorology, Mercury Dies, Metal Shrinking, Rubber Parts Polishing, Dry Ice Converters to make CO_2 gas or liquid, Medical Pathology, Environmental Testing, Nuclear Physics, Vacuum System Traps, Chemical Processing, Food Preservation.

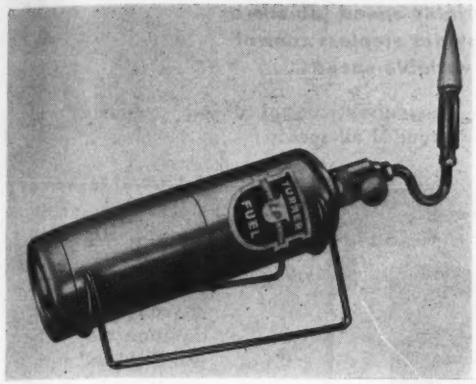
No. 16 LABORATORY DRY ICE PULVERIZER
Makes 100% Powder Rapidly From Chunks up to 3"
$120.00
Motor, Switch, Cord: $20.00

Since 1918—"Supreme" Standard Crushers For Any Material from Wax to Sponge Iron

SUPREME CRUSHERS

Mfd. by Franklin P. Miller & Son, Inc.
36 MEADOW ST., E. ORANGE 2, N. J.

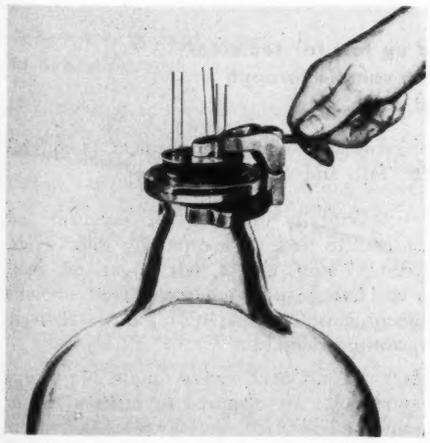
When inquiring check CP 7022 opposite last page



Wire cradle allows burner to be used at any angle

with 5/8" Bunsen burner fittings, standard laboratory tripods, hot plates, and other such equipment. Unit is 5 7/8" high in operating position. Heavy-gage tank is ICC approved.

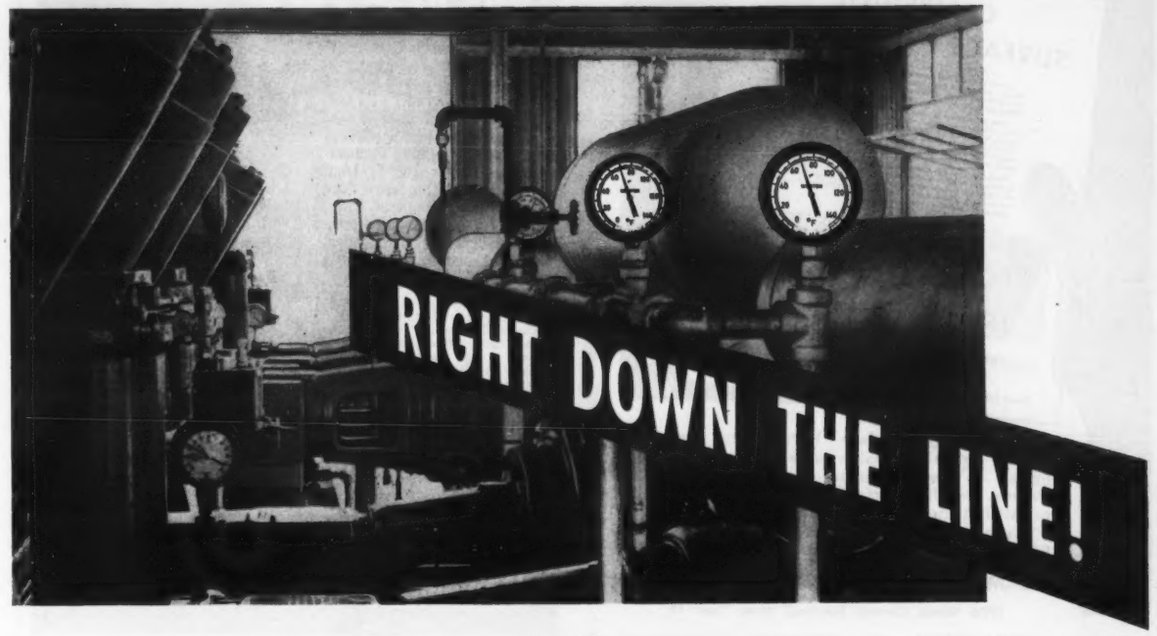
(Portable Bunsen burners are products of Turner Brass Works, Dept. CP, Chauncey & Burress Sts., Sycamore, Ill. . . . or for more information about product reader may simply check CP 7023 on convenient Reader Service slip which is located opposite last page.)



This clamp stops stoppers from popping! Cast from aluminum, it measures three inches from tip to tip of its U-shaped yoke. This fits five-gallon bottles easily. Tightening adjustment screw forces hinged arm tightly against stopper top and holds stopper snug. Arm can be filed or drilled to clear glass tubing. In a pinch (or anytime) clamp makes a handier-than-usual C-clamp for cementing specimens, etc.

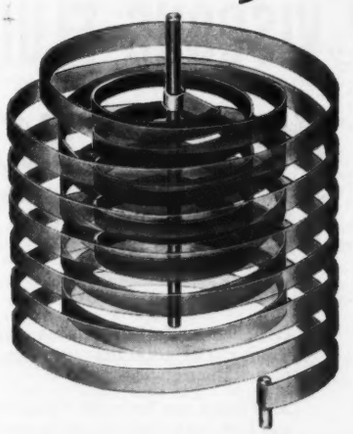
(Stopper clamp is made by Central Scientific Co., Dept. CP, 1700 W. Irving Park Rd., Chicago, Ill. . . . or for more information check CP 7024 on handy form opposite last page.)

DEPENDABILITY



Weston thermometers with Multiple bimetal helix*

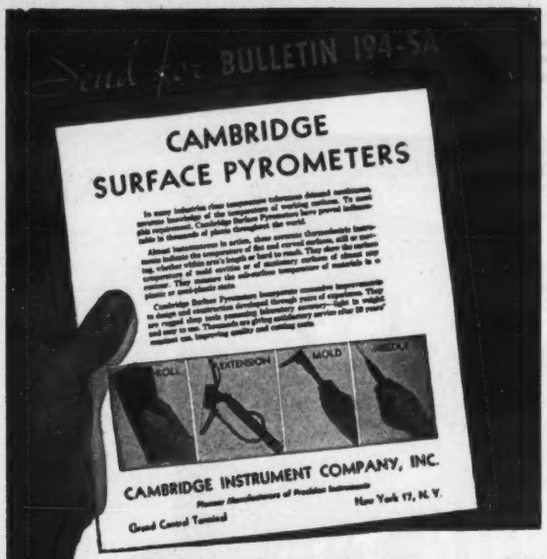
The reasons why WESTON all-metal industrial thermometers excel in dependability and long life . . . enjoy such outstanding preference throughout industry . . . stem in large part from Weston's exclusive design and manufacturing methods. The critical *sensing elements* are all Weston-made in the shorter *multiple helix* form to insure rugged, *nonsagging* units. They are then *cycle-seasoned,* over broad temperature ranges, to insure *consistently precise indications* over far longer periods. Thus they serve better, longer, at far lower over-all costs. Bulletin containing sizes, ranges and prices, available on request. WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J.



WESTON
Thermometers

AVAILABLE THROUGH LEADING DISTRIBUTORS

When inquiring check CP 7025 opposite last page



Cambridge Surface Pyrometers are light weight, portable instruments — accurate but rugged — for measuring temperature of mold cavities and flat surfaces, still or moving rolls, and within-the-mass temperature of materials in a plastic or semi-plastic state. Write for Bulletin 194-SA; 33 illustrations, many applications.

CAMBRIDGE INSTRUMENT CO., INC.
3706 Grand Central Terminal, New York 17

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

When inquiring check CP 7026 opposite last page

TRENT MUFFLE FURNACES FOR THE "LAB"
UNIFORM, CONTROLLED HEAT
for temperatures UP TO 2300° F.

Only Trent Muffle Furnaces feature Trent "Folded-and-Formed" Heating Units—the unique heating unit design utilizing ribbon type resistor element Folded and Formed to give you maximum controlled heat radiation and uniformity . . . plus maximum physical rigidity for longer furnace unit life! Engineered for maximum operating temperatures of 2000° F. or 2300° F., Trent Muffle Furnaces assure faster, more efficient heating at reduced power consumption for chemical processing, enameling, ash determination, fusions and countless heat treating operations.

- Streamlined Design eliminates asbestos millboard and transite fronts
- Welded Construction features outer steel casing lined with laminated layers of high grade brick and slab insulation
- Heating Elements on all four sides of furnace chamber
- Hearth Plate of rugged ceramic, silicon carbide construction
- Fast Action Door—overlapping and plug type
- Built-in Controls: percentage input timer, pyrometer, on/off switch, pilot light, gold fuse

TRENT MUFFLE FURNACES NOW IN TWO NEW SIZES TO MEET YOUR OPERATING REQUIREMENTS

Model HL-4—8¼" x 5¼" x 16¼" deep; 4 KW, 230 volts, single phase, 60 cycle operation

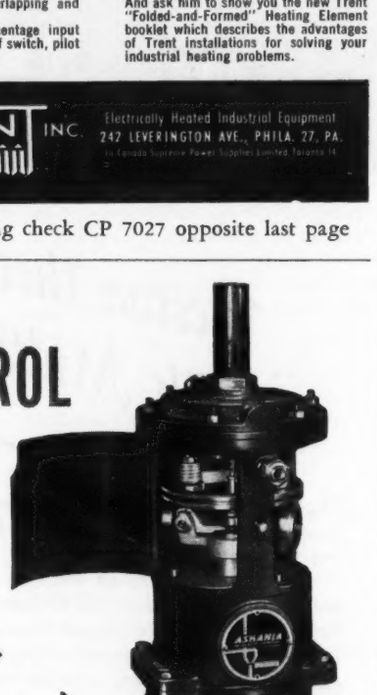
Model HL-6—11¼" x 8¼" x 24" deep; 10 KW, 230 volts, single phase, 60 cycle operation

Let an experienced Trent industrial heating engineer show you how you can improve your heating and processing operations with a Trent Muffle Furnace. And ask him to show you the new Trent "Folded-and-Formed" Heating Element booklet which describes the advantages of Trent installations for solving your industrial heating problems.

TREN INC. Electrically Heated Industrial Equipment
242 LEVERINGTON AVE., PHILA. 27, PA.

When inquiring check CP 7027 opposite last page

FOR MEASUREMENT and CONTROL of VISCOUS FLUID FLOW... the *ASKANIA* TRANSOMETER



Designed for fuel oil and other viscous liquids, the Askania Transometer accurately measures flow and transmits a corresponding pneumatic signal.

This signal can be in the range of inches w. c., to match equivalent gas flow measurement; or in the standard instrument transmitter range of 3-15 p.s.i.

Sturdy Askania construction, over-range protection, built-in integrator, wide range. Write for Bulletin 125.

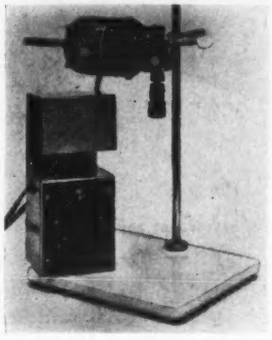
ASKANIA REGULATOR COMPANY
242 E. Ontario Street, Chicago 11, Illinois
Subsidiary of General Precision Equipment Corp.

When inquiring check CP 7028 opposite last page

FOR THE LABORATORY

Variable speed lab stirrer provides stepless control of variable speeds . . .

electronically-controlled unit maintains full torque at all speeds



Adjustable speed stirrer is series-wound DC ball-bearing gear head motor. Motor is driven by phase shift thyratron tube rectifier. Field and armature of motor are fed by two-2050 rectifier tubes. Motor is 1/50-hp, fully-enclosed, and delivers adequate power at low speeds to maintain full torque. It may be operated in either direction and at slow speeds without overheating.

Speed of direct-drive shaft is about 400 to 4000 rpm in stepless control, and speed of gear-driven shaft is 1/18th armature speed.

(Ace No 3650 stirrer is a product of Ace Glass, Inc., Dept. CP, 1938 N.W. Blvd., Vineland, N.J. . . . or check CP 7029 opposite last page.)

Speed up test for sediment — suck sample through record card . . .

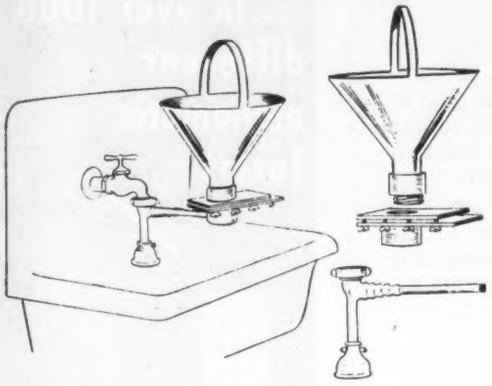
aspirator and funnel arrangement is convenient, fast, and simple to use

Uses: Specifically designed for sediment and scorched particle tests of non-fat dry milk solids, milk, cream, butter, cheese, salt, sugar, oil, margarine, etc. Can be used wherever small amounts of sediment must be separated from a relatively large quantity of liquid.

Features: Equipment is very simple. No pumps or pressure bulbs are required to make a test in one minute or less.

Description: Unit consists of removable stainless steel funnel with welded handle. Locking stem of this funnel fits into a metal magazine which holds record card and filter disc attached to it securely. Funnel, by a quarter turn, locks it in place. Swivel faucet connector allows operator to place tester in various positions over sink. Aspirator pulls sample through.

Adjustable cam valve makes cleaning simple. Cam is closed when tester and funnel will be flushed out and cleaned.



Sketches show construction of tester and how it is attached to faucet for test

Record card is especially designed with disc filter attached. Separate handling of discs is eliminated to speed up operation. Filtering surface is 1⅛ inch standard required for tests.

Tester is constructed of stainless, hard brass with all surfaces nickel and chrome plated.

(Model K-L Sediment Tester is a product of Sediment Testing Supply Co., Dept. CP, 20 E. Jackson Blvd., Chicago 4, Ill. . . . or for more information check CP 7030 on handy form opposite last page.)

Shows how to make analysis in five minutes

Illustrated four-page bulletin is printed in two colors. It describes construction and operation of a tester which can determine hydrogen-carbon ratio of hydrocarbons in five minutes. Operation depends on measurement of density and absorption of beta rays. Annotated cross-sectional schematic makes operation clear.

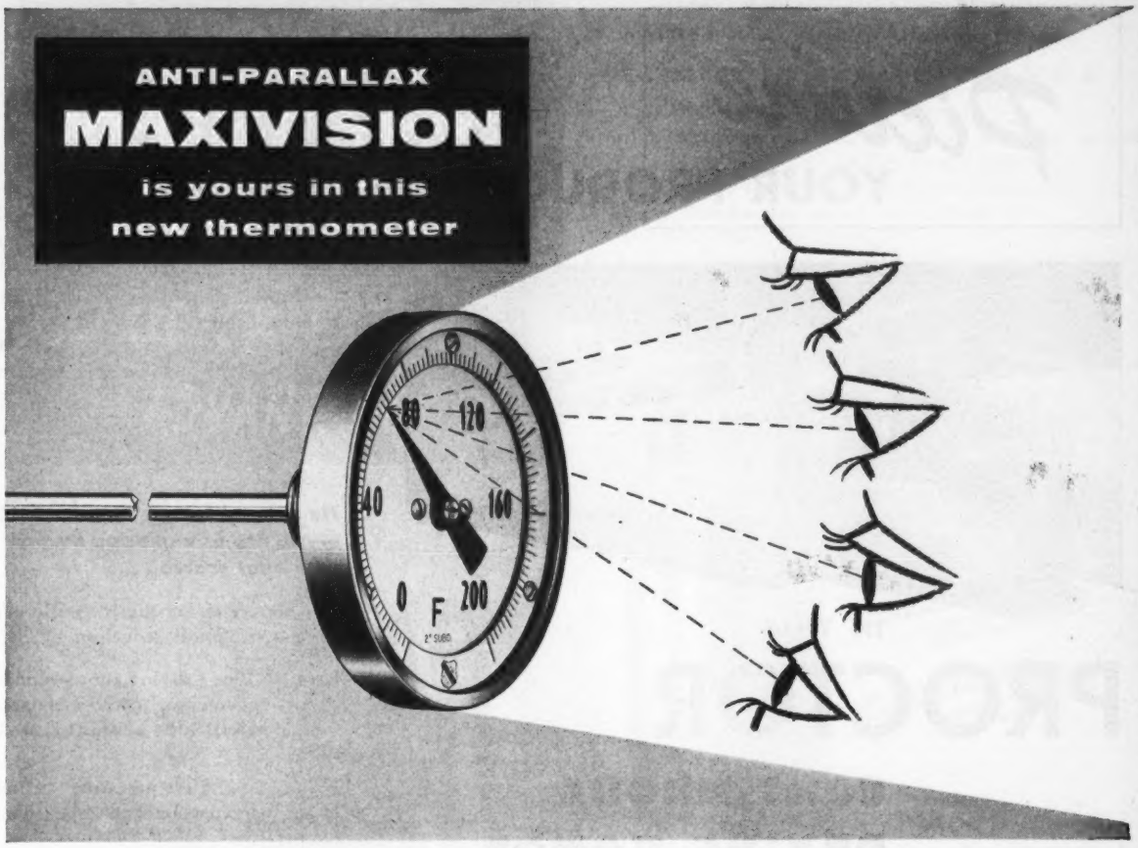
"H/C in five minutes" is issued by Central Scientific Co., Dept. CP, 1700 Irving Park Rd., Chicago 13, Ill. When inquiring specify CP 7031 on handy form opposite last page.

✦ ✦ ✦

THAT'S INTERESTING

Disappearing glassware

To solve that glassware-sorting problem in the lab, Fisher Development Laboratories of Pittsburgh has come up with a one-solution "distinguisher" which makes Pyrex-brand glass disappear when immersed. Thus, when an assortment of pipets or other glassware is placed in a jar, soft glass and quartz remain visible and Pyrex-brand glass becomes invisible when "distinguisher" (reagent-grade trichloroethylene) is added.



Now you can read temperatures *right at the process* with the same ease, accuracy and economy as pressure readings. The Anti-Parallax Maxivision Dial on this new all stainless steel American Bi-Metal Thermometer assures these important advantages. The large, easy-to-read black figures and graduations are carried on a raised ring set close to the glass, with pointer at the same level. Parallax error is practically eliminated.

With this new thermometer in service, field operators can eliminate frequent trips to the control house to observe process changes. Indoors or outdoors, this fine, all stainless steel American instrument is truly climate-proof. Because the case is only 3" in diameter, the thermometer fits where space is limited. Ample clearance behind the case makes installation easy and fast with a small wrench. Read the specification highlights, then get full details about this new high-accuracy American Bi-Metal Thermometer.

PHONE your Industrial Supply Distributor for prompt attention to your needs. He is always ready to help keep your production going by making fast delivery from local stocks.

SPECIFICATIONS

New AMERICAN ALL-STAINLESS STEEL BI-METAL THERMOMETER with ANTI-PARALLAX MAXIVISION DIAL

Dial: Exclusive anti-parallax Maxivision dial, with scale approximately 6" long. Pointer set at same level as scale.

Climate-Proof Case: All stainless steel. 3" diameter. Threaded bezel. Selected clear, extra-heavy cover glass. Heat-resistant gaskets between glass and case seal the thermometer against rain, frost, sand, dust, fumes—climate-proof.

Temperature Ranges: From minus 80° to plus 1000° F. Accuracy within 1% of range.

Low-Mass Bi-Metal Coil: Welded to stem plug. Accurately centered in stem. Non-freezing, non-corrosive silicone fluid on coil dampens vibration, accelerates heat transfer, speeds response; does not gum, resists capillary action.

Pointer: Index type. Easily accessible from front of dial for positive adjustment over entire range. Pointer shaft guided by friction-free bearings.

Stem: 18-8 stainless steel, mirror polished. All joints welded. Resists corrosion. Provides strong, rigid and tight closure against process pressures. Lengths: 2½" to 24".

Connection: Fixed, ½" N. P. T.

Separable Sockets: Available for use in closed systems or where measured medium is corrosive to the stainless steel stem. Fit over all standard stem lengths except 2½".

AMERICAN INDUSTRIAL INSTRUMENTS

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'ASHCROFT' GAUGES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, *Stratford, Conn.* HANCOCK VALVES, *Watertown, Mass.* 'CONSOLIDATED' SAFETY RELIEF VALVES, *Tulsa, Oklahoma.* AIRCRAFT CONTROL PRODUCTS, *Danbury & Stratford, Conn. and Inglewood, Calif.* "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, *Muskegon, Mich.*

When inquiring check CP 7032 opposite last page

Picture YOUR PRODUCT

IN THIS

PROCTOR

CONTINUOUS DRYING RANGE

To improve your product call on Proctor & Schwartz, Inc., who not only manufacture drying equipment, but have the know-how to help you in materials handling problems which arise both in feeding the dryer and delivering your product to subsequent processing equipment.

PROCTOR & SCHWARTZ, INC.
7th STREET & TABOR ROAD, PHILA., PA.

☐ PLEASE SEND BULLETIN 390.
☐ HAVE YOUR ENGINEER CONTACT US.

NAME_____

COMPANY_____

STREET_____ CITY_____ STATE_____

When inquiring check CP 7033 opposite last page

FOR THE LABORATORY

All kinds of labware in polyethylene

Eight-page catalog shows all sorts of polyethylene labware. Equipment stretches from 25 ml beakers, test tubes, weighing bottles, stirring rods to 17 quart buckets. Thirty-five polyethylene types of equipment are illustrated.

"Polyethylene Laboratory Ware" is issued by Palo Laboratory Supplies, Inc., Dept. CP, 81 Reade St., New York 7, N.Y. When inquiring specify CP 7034 on handy form opposite last page.

Flameless "burner" heats to 850°C — no fire or explosion hazard with heat source . . .

hot air stream heats evenly and cleanly without chemical reduction by flame

Uses: For drying, pre-ashing, evaporating, sterilizing, smelting (even metals), softening plastics. Materials may be heated in crucibles or test tubes.

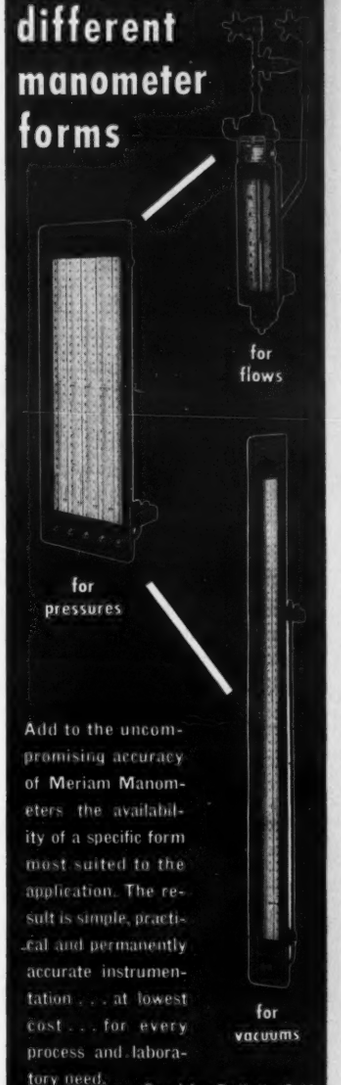
Features: Electro-heating eliminates hazard of fire or explosion from open flame, yet achieves temperatures to 850°C (1560°F). Operation is clean and odorless because stream of hot air heats crucible or test tube.

Description: Air enters base and is heated by acid-resistant radiator in chimney. In one minute after operating toggle switch, hot air is produced by heater. Six knobs formed on top rim of porce-

Air enters base and is heated in "stack"

UNMATCHED ACCURACY

...in over 1000 different manometer forms



Add to the uncompromising accuracy of Meriam Manometers the availability of a specific form most suited to the application. The result is simple, practical and permanently accurate instrumentation . . . at lowest cost . . . for every process and laboratory need.

Send for Bulletin C-12

Meriam Manometer Instrumentation ...for pressures, vacuums, flows, liquid levels.

meriam

INSTRUMENT COMPANY
10920 Madison Ave. • Cleveland 2, Ohio

When inquiring check CP 7035 opposite last page

lain chimney support flask or dish. Special holder of heat-resistant wire can also be used to support heated objects. Overall height is seven inches and diameter of base is six inches.

(Horo Electro-Bunsen Burner is exclusively distributed by the Modern Laboratory Equipment Company, Inc., Dept. CP, 1809-11 First Ave., New York 28, N.Y. When inquiring check CP 7036 on handy form opposite last page.)

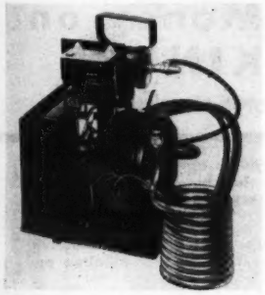
Basic refrigeration unit serves many purposes in the lab . . .

can be used for crystallization, cloud and pour points, cold traps, instrument cooling

Uses: Provides primary or stand-by cooling in the laboratory for such tasks as crystallization, cloud points, pour points, melting points of oils, and for cooling refractometers or viscometers or supplying cold traps.

Features: Powered from 110 volt AC, unit is portable, weighs only 45 pounds.

Description: Hermetically sealed compressor of this refrigeration unit is powered by a 1/8 hp electric motor. Receiver has a four-pound capacity — permitting several changes of cooling coil without replenishing Freon 12 refrigerant. This large reserve gas supply and valve system allow unit to be modified for such widely varying uses as those noted above.



Drops 5 gal of water 30 to 40°F in two hours

Two 6′ flexible insulated hoses allow cooling coil to be placed at a distance from unit. Standard cooling coil dimensions are 8″ x 5″, but special coils are easy to make up. Since unit is completely valved off and equipped with pressure gage, coils can be changed without losing much gas.

Temperature control maintains a 1 to 2° differential depending on conditions. Thermostatic sensing element is connected by 8′ capillary. Usual range of operating temperatures runs from room temperature to 0°F. At 20°F unit can deliver almost 800 Btu an hour. Typical performance includes cooling five gallons of water from room temperature to 32°F in about two hours.

(Portable refrigeration unit is a product of A. Daigger & Co., Dept. CP, 159 W. Kinzie Ave., Chicago, Ill. Check CP 7037 opposite last page.)

HERE'S WHY
PENBERTHY
REFLEX GAGES
OFFER EXTRA
ADVANTAGES

CLEAR, ACCURATE LIQUID-LEVEL READINGS
in all tanks, boilers, vessels, containers and flow lines.

PENBERTHY REFLEX GAGES TYPE V & S

- **A** Alloy Steel Bolts for high temperature service
- **B** Alloy Steel Liquid Chamber heat treated to prevent warping
- **C** Raised Face on Liquid Chamber insures perfect self-alignment of frame with glass and gasket
- **D** Special Composition Gaskets and Cushions are interchangeable
- **E** Resilient Band around glass centralizes it at assembly
- **F** Drop Forged Steel Frame extra heavy and rigid
- **G** Extra heavy beam at end of Frame (prevents distortion when bolts are tightened to meet high pressure service)
- **H** Frame overlaps liquid chamber at all points — provides full backing for the gasket preventing blow-outs
- **I** Alloy Steel accurately threaded nuts

RAISED FACE *IS EXCLUSIVE FEATURE*

The construction of a Penberthy Gage invites comparison to prove superiority. Note especially the easy glass or gasket replacement and glass cleaning made possible by the fully accessible RAISED FACE. Perfect alignment of frame with glass and gasket is assured. Gasket surface can be repaired without removing assembly from vessel.

Designed for temperatures ranging from sub-zero to over 1000° F. and for test pressures exceeding 15,000 psi., Penberthy gages are used extensively for liquids ranging from water to highly corrosive and dangerous chemicals.

Available in a wide variety of materials including bronze, iron, carbon steel, stainless, monel, etc.

WRITE for Catalog No. 35. *Order through your jobber or direct.*

PENBERTHY INJECTOR COMPANY
Division of the Buffalo-Eclipse Corporation
1242 Holden Avenue, Detroit 2, Michigan

There's Certain Satisfaction in **PRODUCTS BY** PENBERTHY

- GAGES
- EJECTORS
- EDUCTORS
- EXHAUSTERS
- SYPHONS
- ELECTRIC SUMP PUMPS
- CYCLING JET PUMPS
- INJECTORS

When inquiring check CP 7038 opposite last page

NEWS from FILTERTOWN

Extremely versatile E&D #613 is equally at home in the laboratory and the industrial plant.

In the former, it is used for analysis of blood to determine sugar content, for hospital analysis tests and as indicator papers.

In the latter, it is used for filtration of such widely diversified products as fruit juices, colognes, drugs, medicinal oils, pharmaceuticals, salt solutions and bees wax.

The physical characteristics of grade #613 are: .006 inches thick, smooth surface, rapidity 60, wet strength 4.8.

We, however, are the very first to admit the likelihood that it does some jobs better than others. And by better, we think in terms of clarity of filtrate, rapidity, and economy.

Thus, we continually stress the advisability of permitting our know-how to help you select the right grade of filter paper for your particular filtration process—or product.

Since E&D has sixty-five years of experience and research tucked away, and since E&D is the only company in America exclusively devoted to the manufacture of filter paper, there's a more than reasonable chance that we can be of help to you.

Write for free samples.

And ask for our Filtration Analysis Report if you have any doubts about whether you're using the right filter paper. No obligation, at all.

E&D The EATON-DIKEMAN Co. FILTERTOWN ® MT. HOLLY SPRINGS, PENNA.

When inquiring check CP 7039 opposite last page

FOR THE LABORATORY

Marking tool writes on all surfaces, resists heat and reagents, comes in 7 colors

Uses: For marking such surfaces as glass, metal, porcelain, paper, plastic, cloth, leather, etc.

Features: Permanent ink resists washing, weathering, rubbing, acids, alkalis, alcohol, autoclaving and temperatures up to 500°F (red resists up to 1000°F). Markings are easily removed, when desired, with common solvents.

Marking tool writes on surfaces with opaque ink and resists temperatures up to 1000°F

Description: Marking tool is available with red, yellow, blue, green, orange, black, or white ink. Original ink supply is sufficient for 25,000 character and refills are available.

(Tech Pen is a product of the Palo Laboratory Supplies, Inc., Dept. CP, 81 Reade St., New York 7, N.Y. Check CP 7040 opposite last page.)

Speeds of 500, 750, 1000 rpm attained by changing belt of stirrer

Uses: Three-speed stirrer is designed for continuous light-duty operations in the laboratory.

Features: Speeds of 500, 750, 1000 rpm are attainable by changing V-belt or round belt on three-step pulley from constant speed motor.

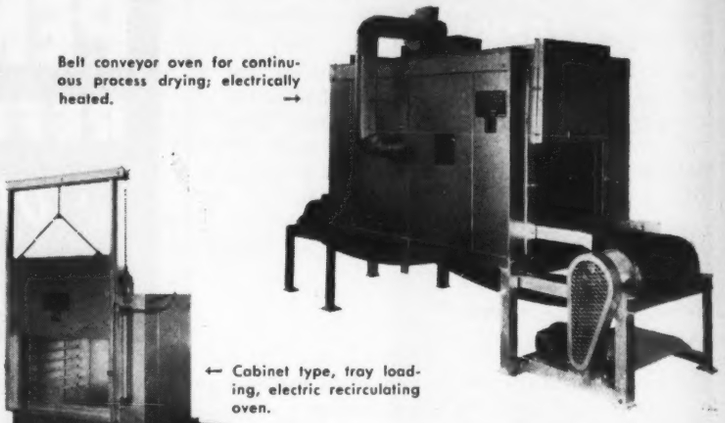
Description: Split-phase induction motor (1/50 hp) turns at 1725 rpm on sintered bronze bearings. Belt drive connects to aluminum three-step pulleys to provide stirring speeds as selected. Spindle of the driven pulley accommodates stirring rods from 7/32 to 5/16" (5.6 to 7.9 mm). Stirrer support 30" high is included.

Stirrer clamp to hold 9" tubular nickel plated steel mounting rod of stirring motor allows stirrer to be tilted to almost any angle in any of three planes.

(Three-speed stirrer is a product of Eberbach Corp., Dept. CP, 200 E. Liberty St., Ann Arbor, Mich. . . . or check CP 7040A opposite last page.)

Get More Efficient Drying in ROCKWELL OVENS

Belt conveyor oven for continuous process drying; electrically heated. →



← Cabinet type, tray loading, electric recirculating oven.

Rockwell ovens are built to your requirements in standard cabinet and rack loading types or in conveyor types; electric, gas, oil or steam heated. Write for profusely illustrated catalog.

ROCKWELL SINCE 1888 BUILT

W. S. ROCKWELL COMPANY

FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY

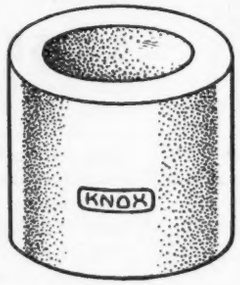
2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

When inquiring check CP 7041 opposite last page

Save Time and Money on TOWER PACKINGS

Specify KNOX for initial installations as well as replacements



Raschig ring

- **KNOX produces porcelain tower packings from the same composition as is used for high voltage electric porcelains.**
- **Resists high temperatures, fumes, vapors, corrosion, liquids, alkalies and acids.**
- **Non-porous — complete vitrification firing 2300°F provides zero porosity.**
- **Modern production techniques and over 30 years "know-how".**
- **Wide range of designs.**
- **Uniform quality.**

If you're interested in Better Tower Packings at lower Operating Cost, we'll be glad to send more information, prices and samples on request.

Other additions to the popular KNOX line for the Chemical Industry!

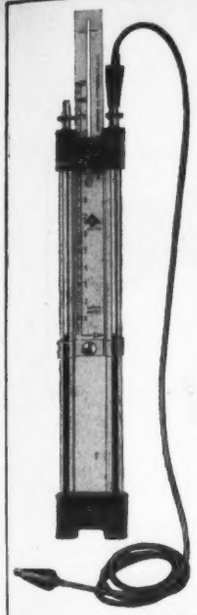
Berl Saddle | Single-partition ring | Cross-partition ring | Triple Spiral ring | Double Spiral ring

MANUFACTURED BY

KNOX PORCELAIN CORPORATION

KNOXVILLE 1, TENNESSEE

When inquiring check CP 7042 opposite last page



BACHARACH *Manometer*

- Body is transparent, high-strength plastic extrusion.
- Scale features easy readability; made of white plastic, with black scale divisions and numerals; 1/10" W scale divisions.
- Indicating Fluid of 1.9 specific gravity permits pressure readings to 1/10" W over entire scale on gauge of convenient size. Fluid is colored blue for visibility; is non-freezing to low temperature. Gauge is furnished filled ready for use.
- Shut-off Valves are conveniently opened or closed by rotation of knurled discs.
- Scale is adjustable up or down to permit direct reading of pressure.
- Blow-over seal automatically prevents spilling of fluid when gauge is subjected to pressure surges in excess of scale range.
- Body serves as reel for rubber hose.
- For convenient attachment of gauge to pipe an adjustable mounting clamp is available as optional accessory.

Gauge supplied with 4 ft. rubber hose and fitting for test connection.

Gauge with scale 0-7" W
$12.40

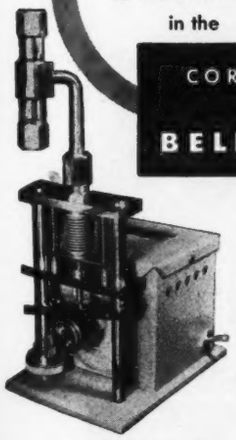
Gauge with reversible scale — 0-15" W on one side, and 0-8.5 ounces per sq. in. on other side.
$15.80

Write for Leaflet 830

BACHARACH INDUSTRIAL INSTRUMENT COMPANY
7301 Penn Avenue, Pittsburgh 8, Pa.

When inquiring check CP 7043 opposite last page

HOW
Contamination Is Prevented
in the
CORSON-CERVENY
MICRO-BELLOWS PUMP



All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds. The use of accurately machined cone-to-taper fittings makes this feature possible.

For this reason, the pump will not contaminate material that it is handling, and is adaptable for many specialized laboratory uses.

For full information about construction, capacity, performance, write for copy of Pump Booklet.

RESEARCH APPLIANCE COMPANY
143 Cemetery Lane, Pittsburgh 9, Pa.

When inquiring check CP 7044 opposite last page

Shows how carts ease lab work

Illustrated with both dimensional drawings and photographs, 12-page, two-color booklet shows how labaratory carts can make lab work easier. Several cart designs are shown for glassware, tote boxes, pans, and so forth.

"Put wheels to work . . ." is issued by Laboratory Construction Co., Dept. CP, 1115 Holmes St., Kansas City, Mo. When inquiring specify CP 7045 opposite last page.

Magnifies up to 75x on large specimens in lab or field

Wide-field microscope can be used for study of minerals and crystals, textiles, and whole biological mounts. Instrument is adjustable to 15x, 45x and 75x magnification. In addition to normal position for desk or bench work, arm or tube may be inclined or reversed to operate in any direction of 360° circle. Tube can be removed and used as pocket microscope in field.

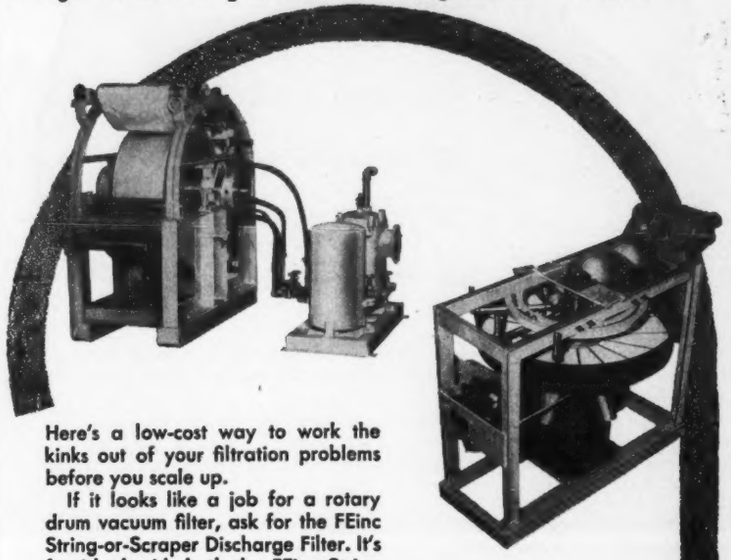
(Mod A microscopes are products of Testa Manufacturing Co.. Dept. CP, 418 S. Pecan St., Los Angeles 33, Calif. Check CP 7046 opposite last page.)

Holds vacuum constant — data tell how

Illustrated data sheet describes a manostat for regulating and holding vacuum within 0.1 mm Hg. Applications of this device include ASTM method D 1160 for reduced pressure distillation of petroleum products.

Data Sheet #10866R is issued by Precision Scientific Co., Dept. CP., 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 7047 on handy form opposite last page.

NOW 2 FEinc
PILOT PLANT FILTERS
help reduce your development costs



Here's a low-cost way to work the kinks out of your filtration problems before you scale up.

If it looks like a job for a rotary drum vacuum filter, ask for the FEinc String-or-Scraper Discharge Filter. It's furnished with *both* the FEinc String Discharge and the FEinc Scraper Discharge mechanisms. You can try first one, then the other. It also has the FEinc submergence washing and compression dewatering mechanisms. These can be operated separately or disconnected if desired. This all-purpose pilot plant filter is available to you on a unique rental-purchase plan, requires no capital investment. Ask for details.

If it's a relatively free-filtering job, such as a coarse crystalline or fibrous pulp, try the simpler FEinc Horizontal Filter first. Particularly good for counter-current or multiple-stage washing. Only 3 ft. dia., with amazingly high output.

Whatever your problem, if it's *continuous* filtration, talk to FEinc first. Our engineering service is backed by 35 years of experience, and by our well-known ability to deliver filters that are tailor-made to fit the job . . . at no more than standard costs.

Ask for Bulletin

Filtration Engineers, Inc.

CUSTOM DESIGNERS AND MANUFACTURERS OF ALL TYPES OF CONTINUOUS FILTRATION EQUIPMENT

FEinc

44 155 ORATON STREET • NEWARK 4, N. J.

When inquiring check CP 7048 opposite last page

"NETONE" Filter Paper

- HIGH TENSILE STRENGTH
- HIGH BURST FACTOR
- ABRASION RESISTANT
- CREASE RESISTANT
- CHEMICAL RESISTANT

"NETONE" Filter Paper is a neoprene impregnated kraft paper that offers decided mechanical and chemical advantages over standard filter papers.

When compared to 60-pound unbleached kraft "NETONE" Filter Paper shows a 500% increase in wet tensile strength, wet burst factor increases from 6 to 57 and there is a marked increase in abrasion and crease resistance.

The following are a few test results indicating comparative resistance factors.

Solution	60-Pound Kraft	Wet Strength Resin	Neoprene Treated (3%)
H_2O	0	72 hr.	86 hr.
10% HCL	0	6 min.	4 hr.
10% NaOH	0	6 hr.	72 hr.

Write us about your requirements and we will be glad to send samples for your testing.

. . . And for your filter cloth requirements we weave fabrics of VINCEL*, Saran, Nylon, ORLON**, Glass, VINYON N†, TEFLON††, DACRON*** and Polyethylene. Samples sent on request.

* TM—NFM Reg. U.S. Pat. Off.
** TM for Du Pont acrylic fiber
*** TM for Du Pont polyester fiber
† TM—Union Carbide and Chemical Co.
†† TM for Du Pont tetrafluorethylene fiber

Weavers of Industrial Filter Media for over Forty Years

NFM The National Filter Media Corp.

General Offices & Mills: New Haven 14, Conn.
Western Office & Factory: Salt Lake City 1, Utah

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Chicago, Ill. 2627 West 19th St. | Cincinnati, Ohio Roselawn Center Bldg. | Houston, Texas 1503 Hadley Street | Oslo, Norway Nicolai Friis | Johannesburg, South Africa Edward L. Bateman

When inquiring check CP 7049 opposite last page

In operation where other units failed in as little as a few days up to six weeks, progressing cavity pumps are —

still going strong after 1½ years pumping abrasive gel

Four units are used 24 hours a day for hard-to-handle silica-alumina slurry

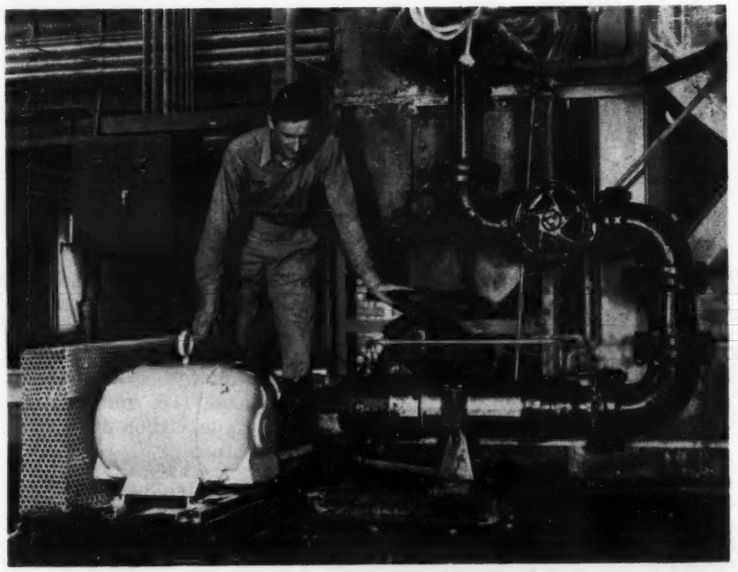
DR. P. L. GROSS, General Superintendent
National Aluminate Corp.
Catalyst Division,
with **FRANK E. McELROY,** Assistant Editor

Problem: Thixotropic and abrasive $SiO_2 \cdot Al_2O_3$ gel had to be pumped in making cracking catalysts at National Aluminate Corporation's Catalyst Division plant in Chicago. With a consistency like that of mayonnaise, gel had acidic characteristics.

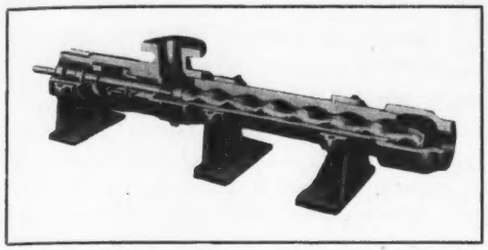
Centrifugal pumps were tried, and lasted 4-6 weeks. Pumps were found to have insufficient pull, and when slurry gelled, pumps spun. Seals were worn by abrasive action of gel, and soon failed.

Rotary pumps also failed, as they depended upon close tolerances. So did the positive displacement pumps tried: the abrasiveness scored them. These units sometimes lasted only 2-3 days.

Solution: Four Model 1L-10H Moyno pumps were installed about 1½ years ago. Pumps have capacity of 150-200 gpm at 600 rpm. Drive is V-belt, powered by an



One of Nalco's four progressing cavity pumps feeds silica-alumina slurry to rotary drum filter



Cutaway shows "corkscrew" construction of rotor and stator. Flow is from right to left

R&M 10 horsepower motor.

As shown in cutaway, pump consists of a rotor that's shaped somewhat like a corkscrew. This revolves inside a stator that has a double helical opening. Rolling action of rotor forms progressing cavities, which convey the material. This rolling action brushes away particles which tend to lodge along seal lines. This, and the fact that seal lines are constantly changing to new surfaces as the rotor revolves, enables the Moyno to handle suspended solids without difficulty and to handle abrasives in suspension with remarkably little wear.

A ¼ inch stainless steel screen protects pumps from foreign bodies entering.

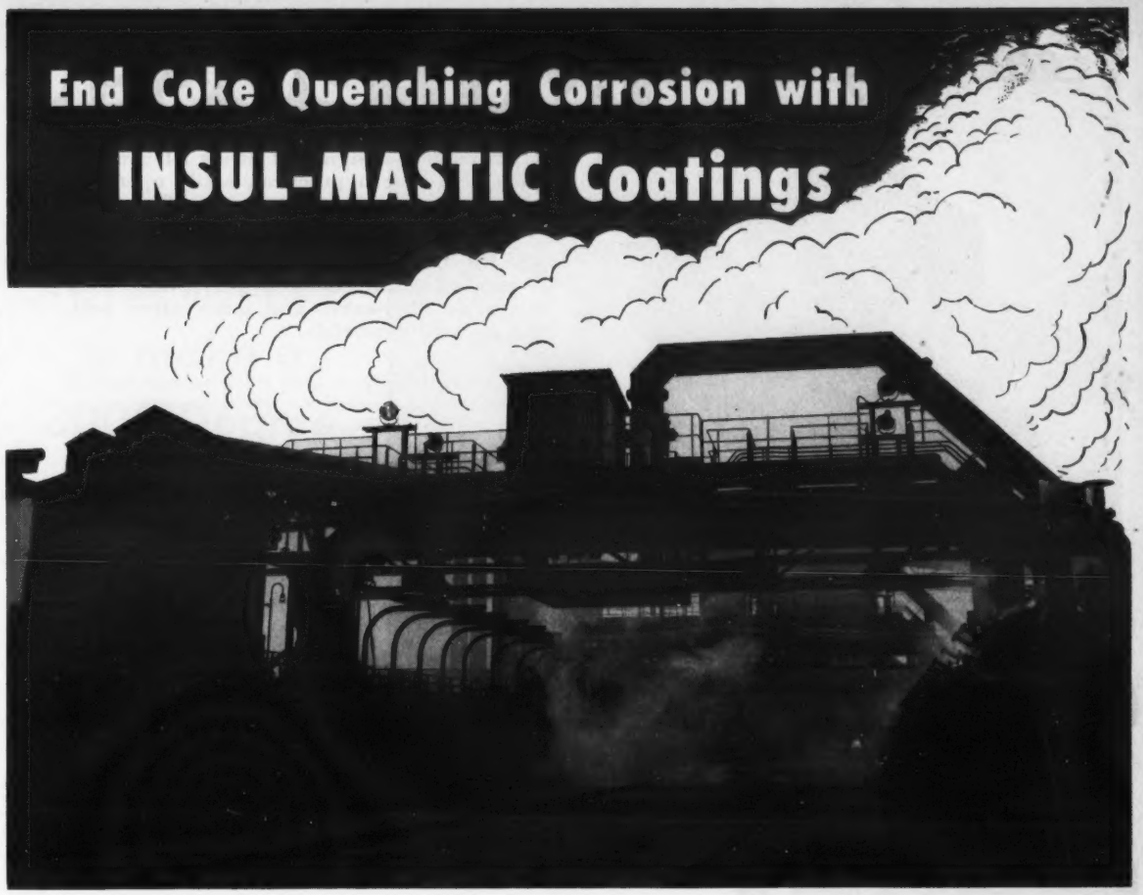
Pumps work against a 20 ft head, and horizontal runs up to 100 ft. Rotor is made of chrome plated stainless steel. Stator is of Goodrich Ameripol rubber. Durametallic packings are used, with lantern rings for introducing water.

Results: Pumps have operated 24 hours a day for 1½ years. Maintenance has been low for pumps in this type of service. Packings are changed about every month.

Performance of the pumps is so outstanding that company has installed similar units in its new California plant, and is adding a fifth in its Chicago plant.

(Model 1L-10H Moyno pumps are a product of Robbins & Myers, Inc., Dept. CP, 1345 Lagonda Avenue, Springfield, Ohio . . . . or for more information concerning manufacturer's product, reader may simply check CP 7050 on the convenient Reader Service slip which is located opposite last page.)

Handling zinc chloride solutions?
Be sure to see data on page 206



Top-view of a U. S. Steel Corp. coke battery at Clairton, Pa., coated with INSUL-MASTIC.

Where do you need a protective coating? Our technical engineers can tell you. Write for information about this consultant service before planning to build or coat.

Here is the top-side of a coke battery. A carload of burning coke has just been quenched. Steam is drifting over all metal equipment in the area. Once this would have meant severe corrosion, but now INSUL-MASTIC protects this equipment.

INSUL-MASTIC coatings are ending coke quenching corrosion in steel mills and chemical plants everywhere. They are extremely durable and not affected by corrosive industrial atmospheres. INSUL-MASTIC coatings now in coke battery service six years prove that many, many more years of life can still be expected. INSUL-MASTIC is a *Superior* bituminous coating having carefully selected mineral fillers. It is spray applied 1/16" to 1/8" thick.

Throughout the nation, mills and plants having coke battery operations are specifying INSUL-MASTIC. They are coating all pipes, tanks, beams and other equipment normally corroded by industrial atmospheres.

Write today for the name of your nearest INSUL-MASTIC representative.

Insul-Mastic

think first of the coatings that last!

Representatives in Principal Cities

CORPORATION OF AMERICA • OLIVER BUILDING, PITTSBURGH 22, PA.

When inquiring check CP 7051 opposite last page

New Raymond RAY-DUCER

THIS modern-design Mill meets all your requirements for a practical, easily operated, high-speed grinding unit for handling your small pulverizing jobs economically.

The Ray-Ducer offers outstanding advantages in producing fine chemicals, dry colors, food mixtures, filter-cakes and many other soft, non-abrasive materials.

1. **Accessibility** — Only a few seconds needed to open mill for cleaning, inspection or changing screens.
2. **Compactness** — Entire unit including mill, motors, variable feeder drive, and hopper, all mounted on a prefabricated base.
3. **Simplicity** — Easy speed control, triple screw feeder in hopper, automatic operation.

Write for BULLETIN No. 73

COMBUSTION ENGINEERING, INC.
Raymond Division
1317 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS
SALES OFFICES IN PRINCIPAL CITIES

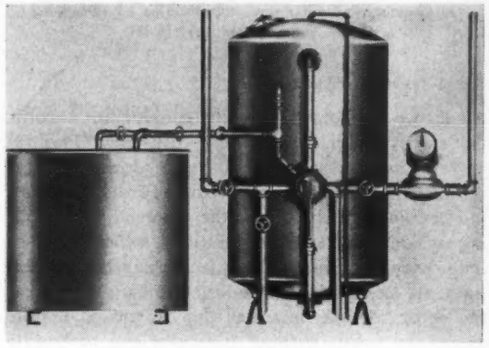
When inquiring check CP 7052 opposite last page

Choice of controls for automatic or manual operation offered on water softeners . . .

regeneration cycle doesn't need operator's attention

Uses: Where soft water supply is necessary in processing, power, and textile plants.

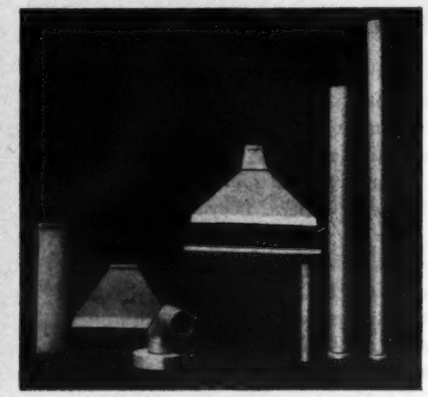
Features: A choice of controls for either manual or automatic operation is offered on units. In automatic operation, steps of backwashing, brining, rinsing and return to service are carried out automatically without operator's attention. In semi-automatic operation, initiation of regeneration cycle is controlled by pushbutton.



Water softeneds are individually designed to meet particular size and capacity requirements

Description: Zeolite water softeners are individually designed to meet the particular size and capacity requirements. Standard equipment is a multiport single control valve. However, if desired a nest of individual valves can be furnished.

(Water Softeners are products of Industrial Filter & Pump Mfg. Co., Dept. CP, 5900 Ogden Ave., Chicago 50, Illinois . . . or for more information check CP 7054 on handy form opposite last page.)



Typical Rigidon Solid Plastic Hood and Duct Sections.

To help **cut your corrosion costs . . .**

look to these solid plastic fabrications

● **Heil Corrosion Engineers have a proven record of years of experience in fabricating both rigid and elastic types of plastics. With experience of over a quarter of a century in the design and manufacture of chemical process equipment, Heil Engineers can offer this exclusive know-how to their wide range of customers. Continuous laboratory corrosion tests as well as scientific studies of methods are carried out for the following types of materials:**

RIGIDON—Glass Reinforced Plastic
RIGIVIN—Rigid Vinyl Fabrications
RIGIDENE—Polyethylene Type Fabrications

Rigivin (rigid vinyl) Exhaust Hood.

write today **for Bulletin 752, 753, 754, for complete information on Solid Plastics.**

CHEMICAL-PROOF LININGS · TANKS HEATERS PLASTICS

HEIL PROCESS EQUIPMENT CORPORATION
12901 Elmwood Avenue • Cleveland 11, Ohio

Other products include: **Impervious Graphite Heating and Cooling Units, Lined Storage and Process Tanks, Steam Jet Agitators, Anodes, Acid-Proof Maintenance Materials, Lead Fabrication, Lined Fans, Fume Scrubbers.**

When inquiring check CP 7053 opposite last page

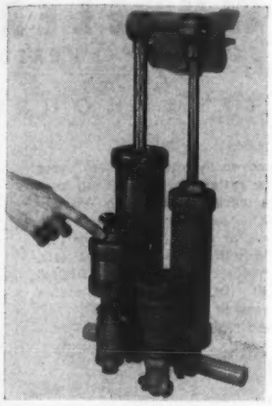
High pressure plus high speed distinguishes compact unit for press closure . . .

three cylinders combine hydraulic-pneumatic operating characteristics

Uses: On presses and other machinery and equipment which must close under strong loading.

Features: Device has long stroke and fast operation through pneumatic-cylinder action, and powerful closing force through differential hydraulic-piston principle — all in a single, compact unit driven by compressed air at regular plant utility pressures.

Description: Pneumatic-hydraulic power unit, called the Hydro-Air Power Unit, consists of three cylinders: one for fast, long pneumatic stroke (at right in photo); a second (largest, at left in photo) providing 12-to-1 multiplication of trapped oil pressure for finishing stroke; and a third (to which finger is pointing in photo) which is a booster cylinder to trigger high-pressure finish stroke.

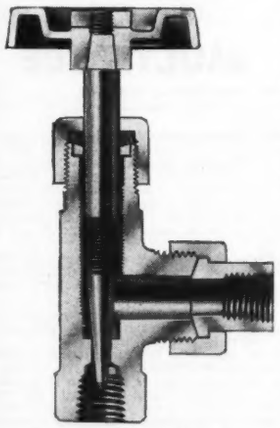


Power unit takes less than 1 cu ft of space

Stroke is 7", terminal force is either 2100 or 5600 lb. Weight of unit is 41 lb, space requirements less than 1 cu ft, and air requirement per cycle less than 0.11 cu ft. Standard one-ton model is 16½" in overall closed length, the heavy-duty model 21".

(Pneumatic-hydraulic power unit is a product of Pantex Mfg. Corp., Dept. CP, 521 Roosevelt Ave., Pawtucket, R.I. . . . or for more information check CP 7055 on the convenient Reader Service slip which is located opposite last page.)

Fine metering made possible by micrometer threads on needle valves



Needle valves also furnished in mountings for instrument panels

Line of needle valves with universal outlets has micrometer thread, stainless steel stems for fine metering. Known as Bull-Dog needle valve, bodies are forged from brass, stainless steel, or carbon steel. Units are also furnished in mountings for instrument panels.

(Needle Valves are products of Carpenter Valve Corp., Dept. CP, 6723 Denison Ave., Cleveland 2, Ohio . . . or for more information concerning manufacturer's product, reader may simply check CP 7056 on handy form opposite last page.)

What it takes to make a 3000 Degree Refractory Concrete

Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

Q. *When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?*

A. No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.

Q. *Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?*

A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

Q. *Then you have a grog, a binder and a method of putting them together. Which is most important?*

A. You can't say that any *one* is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.

Q. *And now, what about the binder?*

A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the prefiring of the binder to produce stable compounds.

Q. *Just how important is the manufacturing or "blending" of the grog and the binder?*

A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, prefiring temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

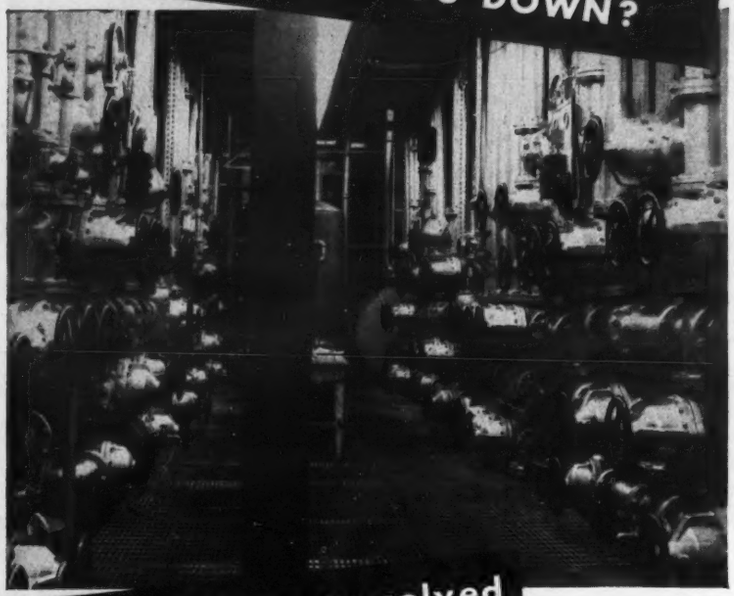
Q. *These factors you've discussed must add up to some specific advantages of Kaocast. What are they?*

A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

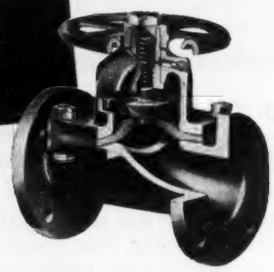
THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.

When inquiring check CP 7057 opposite last page

VALVE MAINTENANCE COSTS GETTING YOU DOWN?



The problem was solved in this plant with HILLS-McCANNA diaphragm valves



IF YOU HANDLE CORROSIVE FLUIDS THEY'LL DO THE SAME FOR YOU

The unique Saunders Patent design of Hills-McCanna Diaphragm Valves completely isolates the working parts of the valve from the flow. There is no packing to tighten or replace . . . no problem of leakage, internally or externally. You have a choice of body materials of any machinable alloy or linings of lead, glass, rubber, plastic, etc. Fifteen diaphragm materials are available including rubber, Neoprene and Teflon. There is also a wide choice of manual or remote operators. Sizes range from ⅜" through 14". May be used at pressures to 150 psi, temperatures to 350° F.

If you valve corrosive materials write today for descriptive folder. For specific recommendations send an outline of your requirements. HILLS-McCANNA CO., 2370 W. Nelson St., Chicago 18, Ill.

HILLS-McCANNA

saunders patent diaphragm valves

Also manufacturers of
Chemical Proportioning Pumps • Force-Feed Lubricators
Magnesium Alloy Sand Castings V-11

When inquiring check CP 7058 opposite last page

High capacity traps handle low loads of condensate . . .

stand pressures to 2500 psi, temps to 1100°F

Uses: In steam trap applications, line of units handles all pressures up to 2500 psi and temperatures to 1100°F.

Features: Trap design includes dual fulcrum which powers valve lever. This includes a primary high-leverage fulcrum for cracking valve from its seat and a secondary low-leverage fulcrum to open valve wide and give maximum unrestricted flow. Efficient discharge arrangement makes possible high discharge flow rates when required, yet permits efficient handling of very low condensate loads.

Description: Steam traps are available in semi-steel, case steel, and forged steel construction. All internal working parts are of heavy stainless steel to withstand the most severe operating conditions.

(Hydro-Flex steam traps are products of Strong, Carlisle & Hammond Co., Dept. CP, 1392 West 3rd St., Cleveland 13, Ohio . . . or for more information check CP 7059 opposite last page.)

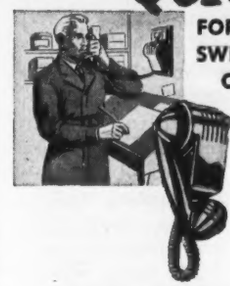
Answers to 15 questions about cooling towers

Extensive information is provided about induced draft cooling towers in 34-page illustrated brochure. Subject is covered by giving answers to 15 commonly-asked questions.

A typical answer is one that gives 10 important factors to consider in selecting cooling towers. In other sections data are presented on design, materials, construction details, and similar vital information.

Bul 4.9.080 is issued by J. F. Pritchard & Co. of Calif., Div. of J. F. Pritchard & Co., Dept. CP, 4625 Roanoke Parkway, Kansas City 12, Mo. Specify CP 7060 opposite last page.

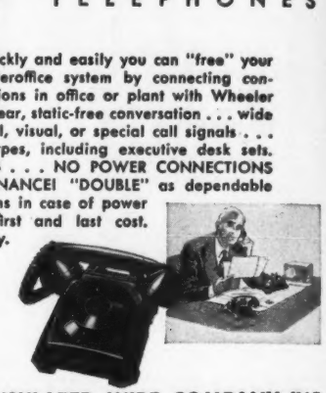
QUICK RELIEF



FOR OVERLOADED SWITCHBOARDS IN OFFICES AND PLANTS
***PLUS* EMERGENCY SERVICE**

WHEELER
SOUND POWERED *Electric* TELEPHONES

Surprising how quickly and easily you can "free" your switchboard or interoffice system by connecting *constantly-called* locations in office or plant with Wheeler phones. You get clear, static-free conversation . . . wide flexibility, with bell, visual, or special call signals . . . choice of many types, including executive desk sets. Yet NO BATTERIES . . . NO POWER CONNECTIONS . . . NO MAINTENANCE! "DOUBLE" as dependable EMERGENCY systems in case of power failure. Low in first and last cost. Write for full story.



***the* WHEELER INSULATED WIRE COMPANY, INC.**
***Division of The Sperry Corp.*, 1112 East Aurora St., Waterbury 20, Conn.**
***In Canada:* Sperry Gyroscope, Ottawa Ltd., Ottawa**
SWH55A

When inquiring check CP 7061 opposite last page

CRESCENT
Polyethylene
MULTITUBE

Crescent Polyethylene Multitube is your answer for economy with lasting dependability in your instrument tubing problems.

Crescent Polyethylene Multitube is composed of 2 to 19, ¼" O.D. Polyethylene tubes up to 1000 feet in length, **spirally cabled together** to allow bending with a short radius without distortion of the tubes. The tubing assemblies are protected by a flexible interlocking galvanized steel armor (Type PA), or by a tough corrosion-resistant thermoplastic sheath (Type PT). Tubes are furnished in 7 contrasting colors for ready identification of each tube at both ends.

Type PA— The galvanized steel armor provides complete protection from injury during and after installation. In the event of fire, the molten Polyethylene is retained within the armor.

TYPE PT— The polyvinyl chloride thermoplastic sheath provides good mechanical resistance, with complete corrosion resistance, and it is flame retarding.

Economy is achieved in the initial cost of CRESCENT POLYETHYLENE MULTITUBE and its accessories, as well as in substantial savings in labor costs of installation. Moderate to long length runs of light weight and compact MULTITUBE assemblies result in fewer connections and fittings, lower cost for supports or racks, ease of mounting, with less space being used.

Crescent Polyethylene Multitube can be pulled through conduit or raceways.

SEND FOR BULLETIN

CRESCENT
INSULATED WIRE & CABLE CO.
TAYLOR ST., TRENTON 5, N. J.

When inquiring check CP 7062 opposite last page

Improves water resistance of adhesive bonds on ceramics, glass . . .

primer changes surfaces so they reject moisture

Uses: As a treatment for various surfaces to improve water resistance of adhesive bonds. It is particularly effective when applied to glass, porcelain, and ceramic surfaces. Also effective with some baked enamel finishes, stainless steel, and polished chrome plate.

Features: Primer offers substantial improvement in resistance to delamination of bonded assemblies that normally are seriously affected by water or high humidity when delamination is due to hydration of surface of material bonded. It changes chemical nature of certain surfaces so they reject moisture rather than accept it. Primer will not improve moisture resistance of assemblies bonded with adhesives which themselves are substantially weakened or dissolved by water.

Description: Primer is a water-thin, pale straw-colored, transparent liquid. It can be applied with soft cloth or absorbent rolls. Coverage is up to 2000 sq ft per gal.

Specimens consisting of baked enameled steel bonded to plastic laminate with a neoprene adhesive were tested in shear after aging at 90 to 95% RH and 100°F with following results:

	Shear Strength (psi)	
Days Aged	Unprimed	Primed
0	600	600
5	250	460
10	40	400

(J-1190 Primer is a product of Armstrong Cork Co., Dept. CP, Liberty & Concord Sts., Lancaster, Pa. . . . or for more information check CP 7063 on handy form opposite last page.)

Includes useful nomograph on water jet eductors

Company's standard and special water jet eductors are discussed in detail in 36-page bulletin. Included is comprehensive information on design, construction, application, and operation. Data are also presented on methods of pumping and moving liquids, and handling solids with these eductors.

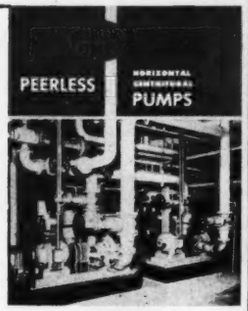
Feature of bulletin is a nomograph which permits determination of use of company's eductor where a standard eductor may not be applicable.

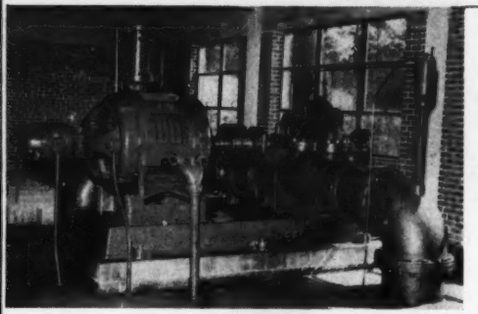
Bul 2-M is available from Dept. J-M, Schutte and Koerting Company, Dept. CP, Cornwells Heights, Bucks County, Pa. When inquiring specify CP 7064 on handy form which is located opposite last page.

look AT THE PUMPING PROBLEM *two ways*

VERTICAL

Ho Rizontal





PEERLESS PUMP DESIGNS PROVIDE THE RIGHT TYPE FOR DOING THE JOB BETTER

You pick the design; Peerless will supply the pump. From one of the broadest range of pump capacities, heads, horsepowers, you can choose a Peerless horizontal or a Peerless vertical pump for almost every liquid transfer job, involving either water or process liquids.

In the picture at the top above, a concentrated solution of sulphuric acid and aluminum sulfate is being pumped by Peerless vertical industrial service pumps. To find out all about them request Peerless Bulletin No. B-505.

The Peerless horizontal type A pump shown just above, is one of three that supplies plant water for a textile mill. To find out all about them request Peerless Bulletin B-1300 and B-1350.

Use the coupon below to find how these Peerless designs can meet all your pumping needs with economy, efficiency and dependability.

PEERLESS PUMPS

fmc

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Factories: Los Angeles 31, Calif., and Indianapolis 8, Ind.
Offices: New York; Atlanta; Chicago; St. Louis; Indianapolis, Ind.; Phoenix; Fresno; Los Angeles; Plainview and Lubbock, Texas; Albuquerque, New Mexico.
Distributors in Principal Cities. Consult your Telephone Directory.

PEERLESS PUMP DIVISION
Food Machinery and Chemical Corporation
301 West Avenue 26, Los Angeles 31, California

Please send bulletins checked below:

☐ PEERLESS INDUSTRIAL SERVICE PUMPS (B-505)
☐ PEERLESS TYPE A HORIZONTAL PUMPS (B-1300)
☐ AND TYPE AS (B-1350)

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

When inquiring check CP 7065 opposite last page

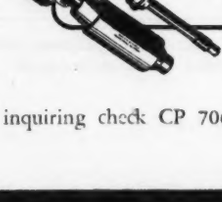
don't be HALF INFORMED

SEE
the amazing Airetool tube expansion control system
...IN ACTION!

Get a demonstration of this *precision* method of rolling perfectly bonded tube joints! The AIRETOOL Tube Expansion Control System rolls expanded joints in *half the time* normally required . . . it makes joints tight and leak-proof every time with no rerolling . . . it eliminates over-expansion and distortion of tubes. Simply set the control and go to work —it's entirely automatic.

Ideal for maintenance and production use, the AIRETOOL Tube Expansion Control System speeds fabrication of condenser and heat exchanger bundles . . . it cuts costs . . . boosts output. Contact your nearest AIRETOOL representative for a convincing demonstration.

WRITE for full details and information on AIRETOOL tube maintenance equipment suited to your particular needs.



AIRETOOL
MANUFACTURING COMPANY
SPRINGFIELD, OHIO

Representatives in principal cities of U.S.A., Canada, Mexico, South America, England and Japan

BRANCH OFFICES: New York, Chicago, Philadelphia, Tulsa, Houston, Baton Rouge

When inquiring check CP 7066 opposite last page

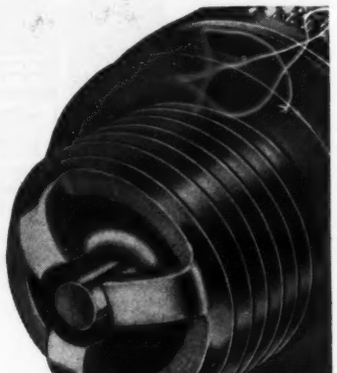
Lower fuel consumption, more power with triple electrode plug . . .

less plug fouling, easier cleaning featured

Uses: In gasoline powered equipment.

Features: Spark plug has three electrodes the gaps of which are factory set. If one electrode burns or erodes away beyond the most efficient gap setting, two others remain properly set to make sure of complete combustion.

In field tests of the plug made by operators, fuel saving up to 40% have been noted. Acceleration and power increases of 6% are also reported.

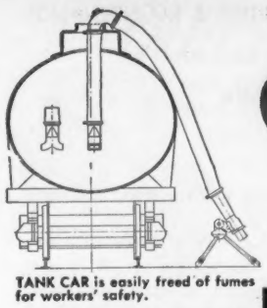


In field tests of plug, fuel savings up to 40% have been noted

Description: In addition to triple electrodes plug adapts solid copper gasket and high quality 95%+ aluminum oxide insulator used in jet aircraft plugs. In operation, turbulence of fuel mixture around three electrodes and through open gaps minimizes lead fouling and cools nose of plug. Exposed gap of plug is exceptionally easy to clean.

Triple-electrode plug is manufactured in sizes to fit all gasoline engines.

(TC-3 triple electrode spark plugs are products of Auburn Spark Plug Company, Dept. CP, Auburn 3, N. Y. . . . or for more information check CP 7067 opp. last page.)



TANK CAR is easily freed of fumes for workers' safety.

CHEMICAL STILL is here ventilated while being repaired.

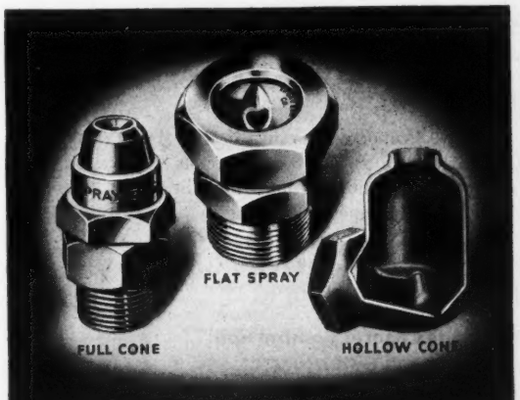
KEEP AIR FRESH
***in confined places with* COPPUS**
Design "A" Ventilator

Improve workers' safety — health — comfort — efficiency. Get rid of dangerous gases, fumes, stagnant air. Coppus Design "A" Ventilator ventilates tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments, fuselages. For complete information, write Coppus Engineering Corporation, 385 Park Ave., Worcester 2, Mass. Sales Offices in *Thomas' Register*.

Other "Blue Ribbon" Products in *Chemical Engineering Catalog*, *Refinery Catalog*, *Best's Safety Directory* and *Mining Catalogs*.

ANOTHER **COPPUS** "BLUE RIBBON" PRODUCT

When inquiring check CP 7068 opposite last page



SPRACO NOZZLES

Write for NOZZLE CATALOG *to*
SPRAY ENGINEERING CO.
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 7069 opposite last page

Design details, specifications on centrifugal pumps

Two bulletins present design details and specifications on self-priming centrifugal pumps of different types. First bulletin, No. 54, describes company's line of pumps which are designed for chemical service. Models include vertical and horizontal, packingless, self-priming and non-priming units.

Second bulletin, No. 53, goes into more detail on a vertical, self-priming centrifugal pump which has no packing or mechanical seal. Details of design are illustrated and a table on the friction of water in pipes is included.

Buls 53 and 54 are available from The LaBour Company, Inc., Dept. CP, Elkhart, Indiana. When inquiring specify CP 7070 on handy form opposite last page.

Resin and catalyst mixed by spray gun as it operates . . .

controls assure uniform mix of components

Uses: In spray-finishing applications where catalyst has to be added to material being sprayed.

Features: Unit is designed to simultaneously spray plastic resin and catalyst, while assuring a uniform mixture of both materials.

Description: With catalyst spray gun, resin is sent through fluid line and catalyst is introduced through air stream. Gun has but one head. When gun trigger is actuated, catalyst and resin meet outside of air cap and are atomized uniformly so that correct amount is applied to surface sprayed.

Trigger on spray gun actuates catalyst and resin feed

To assure uniform mixture, unit has a single pressure control for resin and a double pressure control for catalyst which is governing agent in setting resin. Dual atomizing air pressure control is also provided to insure uniform results regardless of main line pressure variation.

(Catalyst spray gun is a product of The DeVilbiss Co., Dept. CP, 300 Phillips Ave., Toledo 1, Ohio . . . or for more information check CP 7071 opposite last page.)

How to Select an Economical Temperature Regulator

First of all, what does economy mean where temperature regulators are concerned? In some industries it means improvement of product or reduction of spoilage through closer control of process temperatures. In others, it means the paring down of operating expense. The price of the regulator itself is a relatively small factor.

Today's buyers are shopping for:

1. Accuracy of control — not only when the regulator is new, but throughout its service life
2. Dependability — to prevent loss of production time
3. Minimum installation and maintenance cost

Here are a few tips on what to look for when you're installing a new or replacing an old temperature regulator —

Packless construction . . . and for this reason: A diaphragm operated, packless regulator minimizes friction. There are no closely fitted parts to stick or bind because of uneven expansion or collection of foreign matter. Also, there's less maintenance, since no repacking is ever required.

A guarantee against wire drawing of the seats and discs. Insist on it. This guarantee in combination with single seat design assures you of tight shutoff; you avoid expensive steam losses as well as loss of product in a process application.

Broad control range. In a standard regulator you should expect a control range of 100 F. And make sure the unit you select has a vapor tension thermostat that can take over-temperatures of at least 100 F.

Easy maintenance. Why ask for grief? Your temperature regulator should be basically simple in design so that it can be serviced by average plant personnel. All parts should be readily accessible for testing and cleaning.

Double duty. There's no point in buying a separate pressure regulator when you can select a temperature regulator that combines both temperature and pressure control within the same unit.

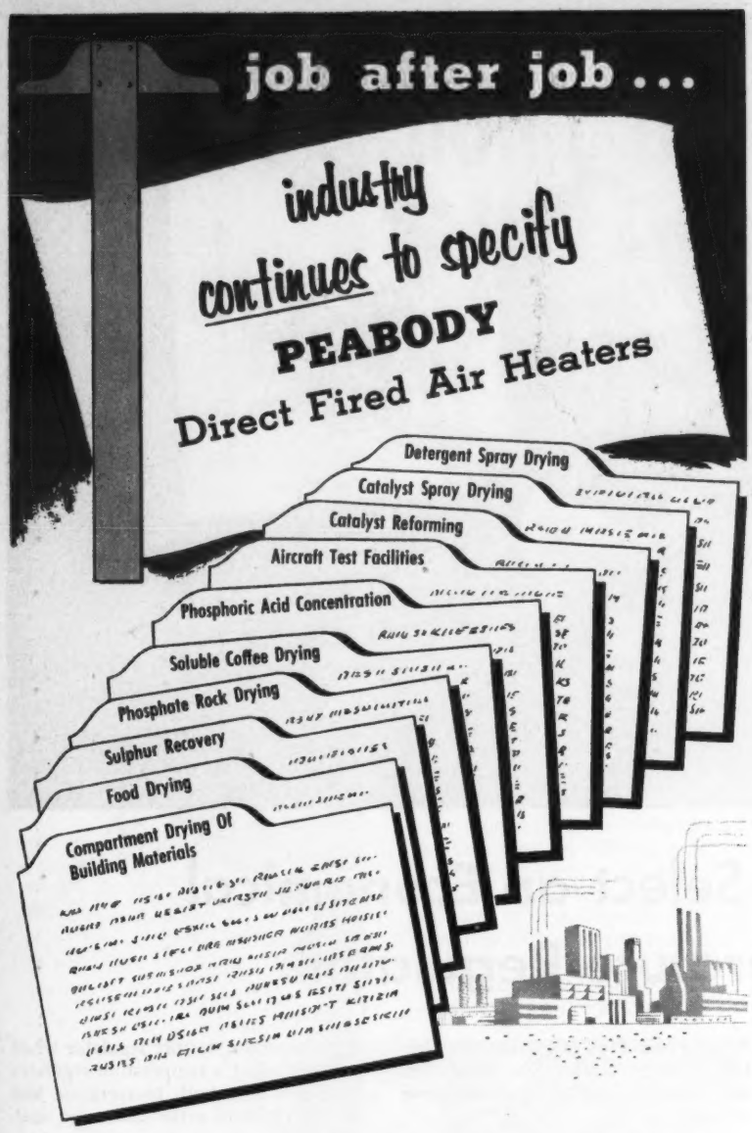
Self-operating. Make sure you get a regulator that operates on its own initial pressure. By doing so, you avoid the purchasing and maintenance of an air compressor plus air piping, and you're sure of uninterrupted operation during electric power failures.

• • • •

All of these points are important to you when it comes to selecting an economical temperature regulator. Perhaps you didn't realize you *could* expect so much. And perhaps you didn't realize that Spence Temperature Regulators offer all these features and more. May we send you our Bulletin T500 containing further details? SE 130

SPENCE ENGINEERING COMPANY, INC.
Walden, New York

When inquiring check CP 7072 opposite last page



• Peabody Direct Fired Air Heaters are so adaptable, effective and efficient, that they're continually specified and used where high-temperature air, above or below atmospheric pressure, is required for intricate processing problems. With a particular air heater, outlet temperatures and firing rates can be varied and controlled either manually or automatically. Variations in firing rate and air flow of 5 to 1 *(and even greater)* are easily attained. Heaters may be fired vertically up, vertically down, or horizontally, as desired. Low pressure loss — a few inches of water — cuts power waste *and* — there's no high pressure blower needed with a Peabody Direct Fired Air Heater. For full details write for Bulletin 600A.

PEABODY ENGINEERING CORPORATION
580 FIFTH AVENUE, NEW YORK 36, N.Y.
OFFICES IN PRINCIPAL CITIES
PEABODY LIMITED • LONDON, S.W. 1, ENGLAND

S-092

When inquiring check CP 7073 opposite last page

For modernizing tanks — a quick-acting manhead

Quick-acting manhead for modernization of large steel storage tanks has recently been introduced. This 13 x 18" manhead is the swing-in type and is available with wing nut or wheel closing fixture. It has a stainless steel ring and a chrome-plated bronze handle, cross arm, and brace. It is furnished ready to install.

(Quick-acting manhead is a product of Dept. 7, Bishopric Products Company, Dept. CP, 4413 Este Ave., Cincinnati 32, Ohio . . . or check CP 7074 opp. last page.)

Application of sampling to many problems

Automatic sampling and its application to many different problems is discussed in 12-page bulletin. Specifications, detailed data, charts, and photographs describe various samplers designed for applications where dust is a problem, where headroom is limited, where mixing of sample is required between sample cuts, or where samples are required from points in the concentration circuit.

Methods of sampling in normally inaccessible places and sampling when acid is present are discussed. A flowsheet sketch suggests key locations for samplers (wet or dry) throughout the circuit.

Bul S1-B4 is available from Denver Equipment Company, Dept. CP, P. O. Box 5268, Denver 17, Colorado. Specify CP 7075 opposite last page.

TYGON "ATD" *Hot Spray* PAINT

BUILDS FILM THICKNESS OF 3 MILS IN ONE PASS!

Here's real corrosion protection — two coats of Tygon "ATD" Hot Spray Vinyl Paint equals five coats of conventional cold spray protective coatings. Not only is the film thicker — it is dense, impermeable, free from pin holes or holidays.

Cuts painting costs, too! Up to 30% saving in labor. No thinners required. Cuts down wasteful overspray.

And offers, of course, the time-proven Tygon resistance to chemical attack.

A ADHESION
T THICKNESS
D DENSITY

Write Today for Bulletin ATD-34
Address Dept CP-555

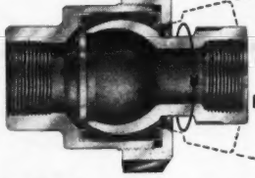
U. S. STONEWARE CO.
PLASTICS & SYNTHETICS DIVISION
AKRON 9, OHIO

61E

When inquiring check CP 7076 opposite last page.

BARCO *Flexible* BALL JOINTS

—when you need movable joints in piping handling



STEAM, OIL, CHEMICALS

Send for New Bulletin No. 215

- Provides for movement in piping—up to 40° side flexibility, plus 360° rotating movement.
- Stainless steel and chemically inert gaskets for strong chemicals. No metal-to-metal contact. Choice of body materials.
- One Barco Ball Joint does the work of two or more ordinary swivel joints because "it moves in any direction!"
- Many models available. For pressures to 7,500 psi; temperatures to 1000°F. 15 different sizes. ¼" to 12". *Ask for recommendations.* BARCO MFG. CO., 537F Hough St., Barrington, Illinois.

THE ONLY TRULY COMPLETE LINE OF FLEXIBLE BALL, SWIVEL, SWING AND REVOLVING JOINTS

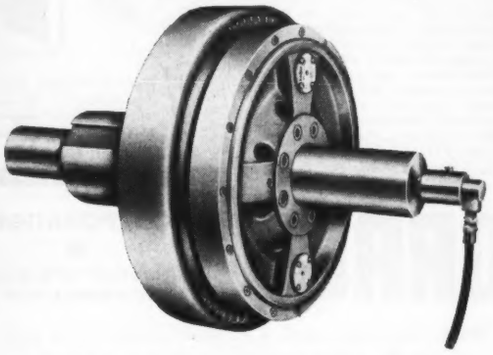
When inquiring check CP 7077 opposite last page

Air clutch can be "inched", engaged, disengaged instantly . . .

provision is made for mechanical engagement in case air supply fails

Uses: On machinery where mechanical clutches are now installed and air clutches are applicable.

Features: Unit responds instantly to a touch of the throttle because a minimum of air is used in operation of clutch. The sensitivity provides "finger-tip" control and ability either to "inch" clutch or throw it into full engagement, as required.



Provision is made on air clutch for internal ventilation

Instant disengagement of clutch is achieved by use of quick release valves built into clutch itself. Provision has also been made on unit for mechanical engagement of clutch in case air supply fails.

Description: Air clutch, called the Air-Grip, occupies minimum space on shaft. It is available from stock in single and double plate models from 8.5 to 806 hp per 100 rpm at 80 psi.

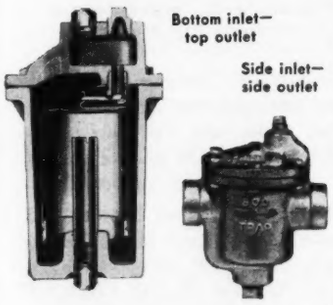
(Air clutch is a product of Dodge Manufacturing Corp., Dept. CP, 2400 Union St., Mishawaka, Ind. Check CP 7078 opposite last page.)

Explanation of batch milling in ball and pebble mills

Complete coverage of the subject of batch milling in ball and pebble mills is given in 32-page manual. Subjects treated include types of mills and linings, principles of grinding, good milling procedures, and controls for better grinding. Photos, tables, and drawings accompany text.

"Handbook of Ball and Pebble Mill Operation" is available by remitting $1.00, with letterhead request or order, direct to Paul O. Abbe Inc., Dept. CP, 139 Center Ave., Little Falls, N.J.

The Steam Trap with a Heart of "Gold"...



Corrosion- and wear-resistant materials; "frictionless" leverage; precision workmanship — add up to LOW MAINTENANCE.

The exterior of the Armstrong trap pictured above sure looks rough, but inside it has a heart of "gold" for its owner, Chemicals, Inc., Chicago, makers of zinc chloride.

Fuel Saving—coal consumption has been cut ½ carload per month since installing Armstrongs to drain kettle coils.

Time Saving—processing time has been cut from 5 days down to 3 days on one zinc chloride tank since installing an Armstrong trap on each of its three coils.

Maintenance Saving—occasionally holes are eaten right through submerged steam coils, allowing acid to get into traps. The stainless Armstrong mechanisms have withstood this abuse successfully. Trap maintenance generally has been negligible. The trap shown above has been on the job working perfectly for five years without repairs.

Take a tip from Mr. Stanley Nykiel, plant operator, who says *"I've tried other kinds, but Armstrongs work best."* Call your local Armstrong Representative (see classified directory or Thomas Register) or write:

ARMSTRONG MACHINE WORKS
880 Maple Street • Three Rivers, Michigan

Application Engineered
ARMSTRONG STEAM TRAPS

SEND FOR CATALOG J
The 44-page Steam Trap Book gives complete trap data and prices plus useful selection, installation and maintenance information. Armstrong traps also catalogued in Sweets and Chemical Engineering Catalog.

S151

When inquiring check CP 7079 opposite last page

Whether its a kettle, reboiler, reactor or other process equipment, Manning & Lewis engineers and craftsmen are ready to design and fabricate a unit, tailor-made to fit your particular process need, and priced to fit your budget.

You need only supply the performance requirements. An experienced M & L engineer will take it from there and specify type, size, method of construction, etc.—all the essentials that have made Manning & Lewis equipment preferred in plants from coast to coast.

Send your inquiry or have a M & L representative call.

Manning & Lewis
Engineering Company
30 Ogden Street Newark 4, New Jersey
M&L

When inquiring check CP 7080 opposite last page

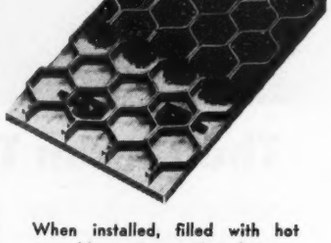
MAINTENANCE

Heavy wear won't hurt steel flooring

Uses: For resurfacing existing concrete or wood floors on ramps, factory aisles, loading docks, in-plant traffic surfaces, or wherever rough usage decreases lasting durability of surface area.

Features: When installed, filled with a hot or cold mastic, product forms a continuous steel floor armor which eliminates cracking, swelling, warping, and shrinking. These armored floors are impervious to wheels of any size and are designed to take the brunt of rolling loads.

Exposed steel surface armor is 18.15 sq in per sq ft, and weight of the armor is 1.7 lb per sq ft.



When installed, filled with hot or cold mastic, grating forms a continuous steel floor armor

Description: Armour steel panels are fabricated for simple installation. Sides and ends are easily locked together on job site to form a continuous steel armored floor.

(Baby Hexteel steel flooring is a product of Klemp Metal Grating Corp., Dept. CP, 6603 S. Melvina Ave., Chicago 38, Ill. Check CP 7081 opposite last page.)

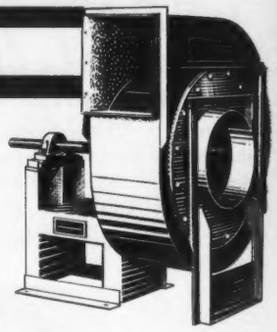
Cement for vinyls

Data sheet describes properties and uses of a solvent bonding agent for cementing most vinyl plastics.

Data Sheet V-50 is issued by Schwartz Chemical Co., Inc., Dept. CP, 326-328 W. 70th St., New York 23, N.Y. Check CP 7082 opposite last page.

NOW from DRACCO!

performance proved industrial fans



For All Air Handling Jobs
- General ventilation
- Dust collection
- Fume and high temperature exhaust work
- Conveying refuse, shavings, stringy materials

Dracco Industrial Fans—"Performance Proved" by 15 years' use with Dracco Dust Control systems—give longer, trouble-free service. Superior construction—welded, vibration-free, all steel elements, no castings to crack, precisely balanced, Rotation and discharge adjustable. Wide range of sizes—inlet diameters 11"-38", pressures to 17" S.P., volumes from 500-46,000 CFM. For better performance, specify Dracco Fans. For details, contact:

Write for 40-page Dracco Fan Bulletin No. 601 containing complete performance data and specifications.

DRACCO CORPORATION
4070 EAST 116th STREET
CLEVELAND 5, OHIO

When inquiring check CP 7083 opposite last page

NEW PACKLESS

Stainless Steel Solenoid Valves

½" ¾" 1"—Piston Pilot Operated
⅛" ¼"—Direct Lift

"Velvetrol" cushioned closing eliminates damaging shock . . . Packless . . . Meet wide range of service and pressure requirements . . . Body and all internal parts stainless steel . . . Guaranteed coils hermetically sealed in thermoplastic casings, and glass-wound silicone insulated for high temperatures.

WRITE FOR NEW BULLETINS!
Bulletin K . . . Stainless Steel Solenoid Valves
Bulletin 500-B . . . Brass Solenoid Valves

GOULD SOLENOID VALVES

VELVETROL

J. D. GOULD CO. • 730 E. WASHINGTON ST. • INDIANAPOLIS 2, IND.

When inquiring check CP 7084 opposite last page

Vibration, shock, noise control

Actual "case history" photos of installations of vibration eliminators in various industries supplement material descriptive of vibration, shock and noise control presented in 4-page bulletin.

Bul K 4 A is available from The Korfund Co., Inc., Dept. CP, 48-15 32nd Place, Long Island City 1, N.Y. Specify CP 7085 opposite last page.

Easily-washed-off stripper is very thick, won't run off vertical surfaces

Uses: Removal of industrial lacquers, vinyls, phenolics, rubber base, epoxy, and baked-on finishes as well as maintenance paints and coatings.

Features: Stripper is made in heavy viscosity so that it will adhere to vertical surfaces without sag.

Description: Non-flammable, odorless, solvent paint stripper dissolves and wrinkles finish which can then be flushed off with water leaving a base surface ready for repainting. It can be used on all ferrous and non-ferrous metals, wood, and concrete without any ill effects.

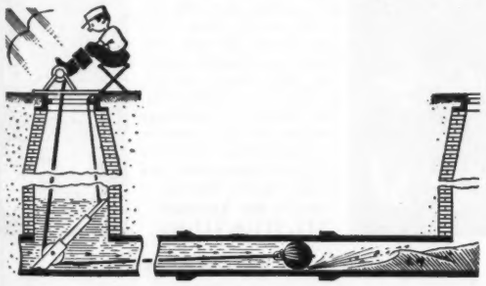
(Walgarite 10 paint stripper is a product of Corrosion Control Company, Inc., Dept. CP, P. O. Box 31, Queens Village 29, N. Y. . . . or for more information check CP 7086 opposite last page.)

✦ ✦ ✦

THAT'S INTERESTING

Rubber ball cleans sewer

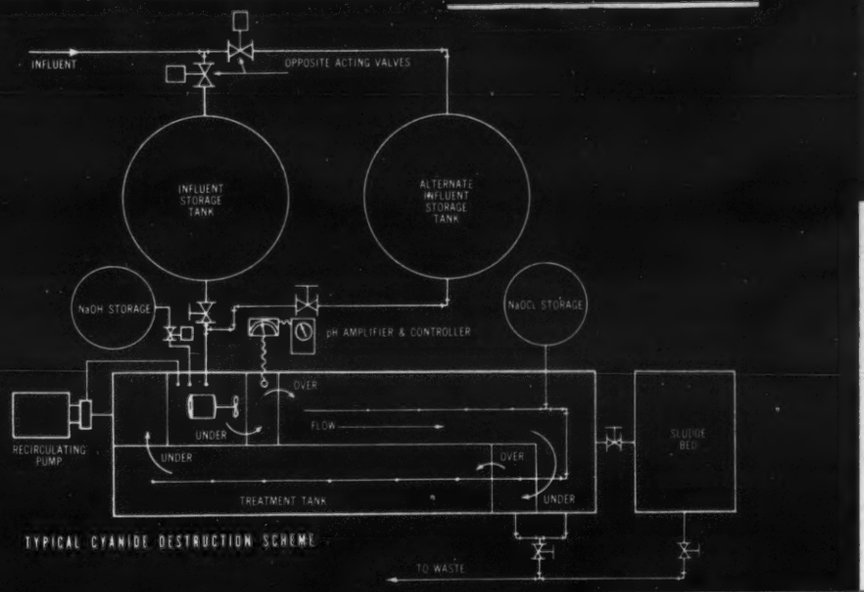
A hollow neoprene ball provided with ribs along the periphery has been developed as a water main and sewer cleaning device. In operation, the ball is tied to a rope and air-inflated to fit snugly in pipe. Ball is inserted in line at a manhole and a 15 to 20-lb tension is maintained on the rope



as ball is carried downstream. When head of water exceeds air pressure in ball, a jet of water is released under the ball, sweeping sediment ahead of it. At the same time, ribs on ball scrape slime from pipe walls. (Du Pont *Neoprene Notebook*)

INDUSTRIAL WASTE TREATMENT SYSTEMS

CUSTOM ENGINEERED BY WAGNER BROTHERS



Wagner Brothers' engineers will design and install any type of waste treatment system, custom engineered to accommodate your particular plant requirements.

With Wagner Brothers Waste Treatment systems, you can be sure of *positive, economical* waste treatment requiring a *minimum of operating and maintenance cost.*

Write now, giving full details of your waste problems.

COMPLETELY ENGINEERED INSTALLATIONS FOR:

- CYANIDE DESTRUCTION
- CHROMIUM RECOVERY OR DISPOSAL
- OIL EMULSION SPLITTING
- ION EXCHANGE

WAGNER BROTHERS, INC.

520 MIDLAND • DETROIT 3, MICH.

REPRESENTED IN

CHICAGO • ROCHESTER • CLEVELAND

CINCINNATI • INDIANAPOLIS • NEW YORK

WAGNER BROTHERS, INC.
520 Midland Ave.
Detroit 3, Michigan

☐ Please have representative call to discuss our waste treatment problems.

☐ We are briefly describing our present waste treatment problem on the attached sheet. Please recommend the best method of processing.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 7087 opposite last page

. . . and for Gentle Drying

Nerco-Niro*

"Gentle" is one word that aptly describes Nerco-Niro Spray Drying. The instantaneous transition of the processed material from liquid to solids involves no harsh sweepers or scrubbers.

Uniform atomization and unique distribution of the drying air result in closely controllable particle size and moisture content.

Nerco-Niro's system allows application of high inlet air temperatures without damage to heat-sensitive products.

Extensive facilities containing both pilot plant and commercial size spray drying installations are now at your service in our new laboratories.

Write for Bulletin No. 226.

Nichols Engineering & Research Corp.
Nerco-Niro Spray Dryer Division
70 PINE ST., NEW YORK 5, N. Y.
1637 N. Illinois St., Indianapolis 2, Ind.
1477 Sherbrooke St. W., Montreal 25, Canada

*Reg. U. S. Pat. Off.

Nerco-Niro . . . the engineered Spray Dryer

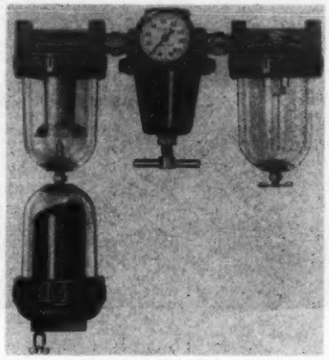
When inquiring check CP 7088 opposite last page

Removes 98% of moisture from air supplying pneumatic units . . .

also controls air volume, adds lubricant

Uses: Automatic conditioning and control of compressed air used in operation of pneumatic-powered equipment.

Features: From compressed air, introduced into filter part of unit, is removed all pipe dust, rust, and scale, and 98% of free moisture. Entrainments are deposited in bowl.



Handles standard air flows in pipe sizes ¼ to 1"

Description: Attached to filter bowl is a trap which collects accumulated moisture and ejects it into container or service drain. Trap operates automatically regardless of pressure fluctuations or flow of air.

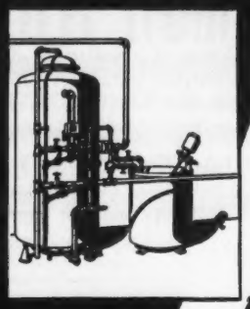
Regulator on unit accurately controls operating pressure of compressed air.

Clean, dry air passes from regulator into lubricator where, automatically and in proportion to air volume, a fine fog of oil is injected into air stream to lubricate equipment served by air.

Control and conditioning unit is designed to handle standard range of air flow in pipe line sizes of ¼ through 1".

("Autopneumatic Control" compressed air conditioner is a product of Arrow Tools Inc., Dept. CP, 1904 S. Kostner Ave., Chicago 23, Ill. Check CP 7089 opp. last page.)

Mixed-Bed Ultra Deionizer



REMOVES ALL MINERAL IMPURITIES FROM WATER for as little as 18c per 1000 gallons

The Elgin Ultra-Deionizer produces water of even higher quality than obtained by distillation or evaporation at a mere fraction of the cost. It is a compact, easy to operate unit which requires very little space. Containing a mixture of cation and anion exchange resins in a single tank, it is low in investment and operating cost. Ask for Bulletin 512.

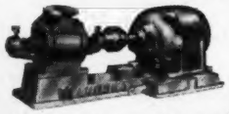
ELGIN-REFINITE DIVISION
ELGIN SOFTENER CORP.
180 NORTH GROVE AVENUE, ELGIN, ILLINOIS

OTHER PRODUCTS Write for Bulletins | Softeners • Dealkalizers • Lime Soda Softeners • Deaerating Heaters • Filters • Treatment

When inquiring check CP 7090 opposite last page

Better on "1001" Pumping Duties

Capacities to 150 G.P.M.



Heads to 500 Ft.

APCO Two-Stage Turbine Type Pump for High Pressure Service

Apco—the pump with but one moving part, the impeller — is famous for long-lived, efficient performance on small capacity, high head duties. Available in Single Stage, Two Stage and 4-Stage Tandem for high pressures — and Water Jacketed for high temperature and highly volatile liquids.

Write for Bulletins 111, 111-A, 111-WJ

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
62 LOUCKS STREET AURORA • ILLINOIS

When inquiring check CP 7091 opposite last page

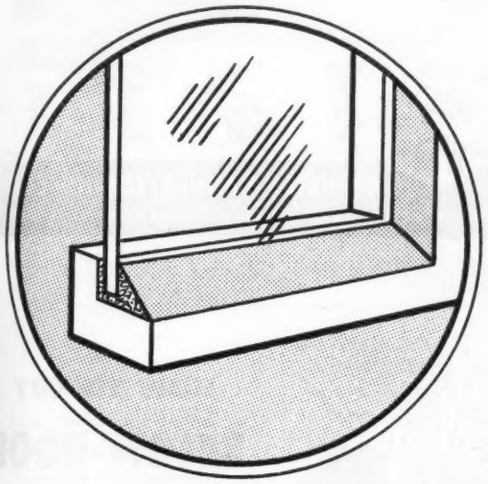
Glass breakage costs cut by non-drying, flexible glazing compound . . .

absorbs vibration and shock usually transmitted to glass

Uses: When installing or replacing glass in steel frame or wood sash windows.

Features: Glazing compound is non-drying. It does not set hard, but films over on top and remains permanently elastic underneath. It absorbs jars, jolts, vibration, and shocks which ordinarily would be transferred to glass.

Use of compound is said to practically eliminate breakage of glass, thus saving time and cost of maintenance glazing.



Glazing compound comes in seven colors to match or harmonize with sash or trim

Description: Glazing compound is formulated from non-drying, water-repellent oils, fine grained pigments, and Canadian asbestos. It is shipped completely mixed and ready to use, requires no premixing and no thinning, does not stick to hands.

(Cushion Glaze non-drying glazing compound is a product of The Lincoln Oil & Paint Co., Dept. CP, 3921 Mayfield Rd., Cleveland 21, Ohio . . . or for more information check CP 7092 on handy form opposite last page.)

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on pages 214 to 217. All products and services discussed in this issue, in either editorial or advertising, are listed there.

Lapp Valves are Solid Porcelain

You need to make no compromise with contamination or corrosion from valves in chemical processing. Lapp valves are of *solid* Lapp Porcelain, a material unique as a ceramic for industrial scale chemical service. It alone offers the following combination of characteristics and qualities:

PURITY • Lapp Porcelain is a potassium aluminum silicate, made from selected clays, flint and feldspar...has no free iron or other metallic impurity.

NON-POROUS • Complete vitrification of all sections, through firing to 2300°F., provides *zero* porosity. No dye penetration of body in 100,000 psi test. No chemical can penetrate in service.

HIGH MECHANICAL STRENGTH

Compression strength ..... 100,000 lbs. per sq. in.
Tensile strength ..... 8,000 lbs. per sq. in.
Modulus of rupture ..... 15,000 lbs. per sq. in.

CHEMICAL RESISTANCE • Lapp Porcelain is unaffected by any acids except HF. It provides years of trouble-free service, handling hot acids in all concentrations, as well as mixed acids and other troublesome combinations.

UNIFORM QUALITY • Lapp Porcelain has been manufactured for 38 years for use in most severe chemical, electrical and mechanical services. Plant facilities include Lapp-patented vacuum processing, deaerating pug mills, two continuous tunnel kilns, and complete chemical, electrical and mechanical test equipment.

Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 429 Wendell St., LeRoy, N. Y.

An electrical test is the most searching inspection for physical soundness! Porcelain bodies for Lapp valves above are being flashed over—at 70,000 volts for three minutes. Any physical defect is revealed as an electrical puncture.

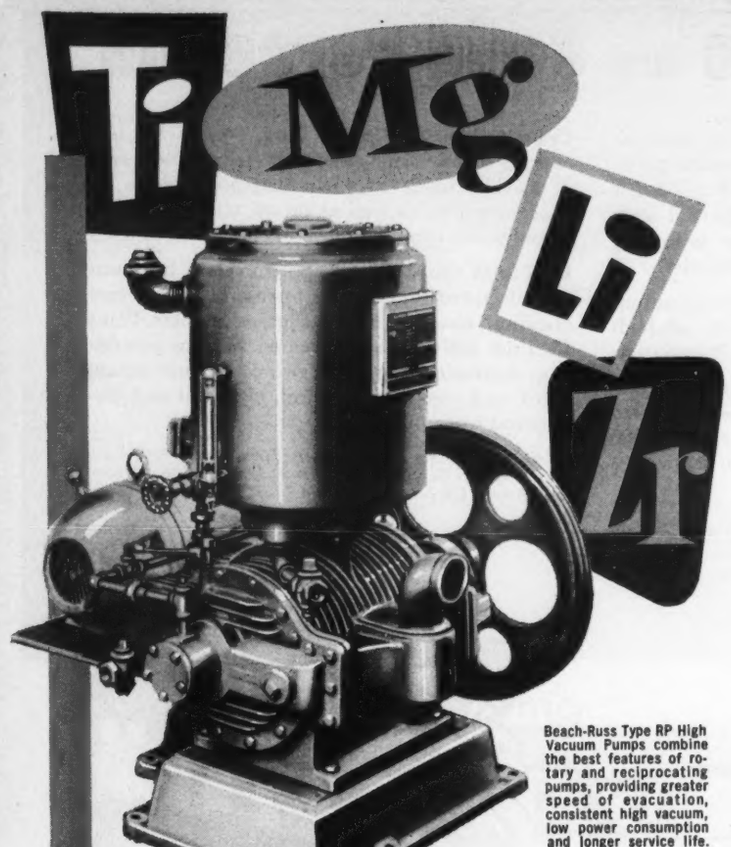
Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment.

Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipe • Raschig Rings
Pulsafeeder Chemical Proportioning Pumps

When inquiring check CP 7093 opposite last page



Beach-Russ Type RP High Vacuum Pumps combine the best features of rotary and reciprocating pumps, providing greater speed of evacuation, consistent high vacuum, low power consumption and longer service life.

Whether it is titanium, magnesium, lithium, zirconium, germanium, calcium, silicon, vanadium, etc. . . . if your process requires vacuum operation, your working vacuum can be reached faster and at lower cost with

BEACH-RUSS
Rotary Vacuum Pumps

The Beach-Russ Type RP Pump is used extensively in processes involving vacuum or inert atmospheres for induction or arc melting, heat treating, alloying or refining. This versatile pump is available in capacities from 20 to 1800 c.f.m. for any laboratory, development or production work. It can be used on either a straight mechanical system, or in combination with a diffusion pumping system for higher vacuums.

The superior design, high efficiencies and slow operating speeds make the Beach-Russ Type RP Pump the best available mechanical pump for your work. Catalog 90 tells the full story.

BEACH-RUSS COMPANY
50 Church Street • New York 7, N. Y.
Address Department 46

When inquiring check CP 7094 opposite last page

Boiler gasket re-use possible with impregnant . . .

material also serves as inert thread sealing compound

Uses: Impregnation of gaskets used on boilers.

Features: Graphite plastic material keeps gaskets soft and enables their re-use several times, eliminating gasket changes each time a boiler is cleaned.

Description: Because of a high coefficient of expansion, graphite plastic material is especially suited for high-temperature services. Material is also suggested as a positive, dependable seal for pipe joints, screw threads, gasket joints and flanges on hot or cold petroleum lines, and on propane, butane, steam, coal tar, vapor, acid lines.

(Vike graphite plastic boiler gasket impregnant is a product of Keystone Lubricating Company, Dept. CP, 21st, Clearfield and Lippincott Sts., Philadelphia 32, Pa. . . . or for more information check CP 7095 on handy form opposite last page.)

High-temp properties of selected alloys

This 208-page report is the third in a current series which presents the effect of temperature on the properties of metals. Primarily this report is a graphic summary of the elevated-temperature strength data for 13 selected super-strength alloys.

Included are 116 summary curves showing tensile strength, 0.2% offset yield strength, per cent elongation and reduction of area, stresses for rupture, and stresses for creep rates of 1%.

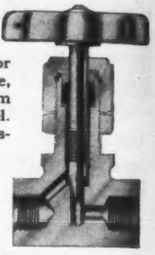
Special Technical Publication No. 160 is available by remitting $4.75 direct to the American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. For more information check CP 7096 on handy form opposite last page.

REPUBLIC VALVES
INDUSTRIAL • CHEMICAL • AIRCRAFT

10,000 psi WORKING PRESSURE FORGED BODY

One-piece, stainless steel, forged body and stem guide, with no brazing or welding—*can't* leak or come apart. Has many uses in water, gas, oil, and vacuum service.

Proofed at 25,000 psi for 10,000 psi working pressure, to 200° F. Semi-needle stem of *hardened* stainless steel. Available with graphited asbestos or Teflon packing.



Easy grip handle. Panel mounting. Female pipe connections, sizes ⅛" up to ½".

Ask for new catalog No. 654, showing entire line.

Distributors in principal cities coast to coast.

RM REPUBLIC MANUFACTURING CO.
15655 BROOKPARK ROAD • CLEVELAND 11, OHIO

When inquiring check CP 7097 opposite last page

HOW TO CUT BELOW-ROOF HEAT 13° to 26° *Immediately!*

Brush or spray on Tropical Roof Coolerant and *feel* the difference at once! This non-staining, bright metallic coating reflects up to 70% radiant heat away from the roof, cuts below-roof temperature up to 26° to give hot-weather comfort. Anyone can apply Tropical Roof Coolerant quickly, easily, at low cost. Do it NOW!

LENGTHENS ROOF LIFE, TOO!

Bright, seamless Roof Coolerant metallic shield prevents drying action of summer heat, keeps roof flexible, prevents cracks and leaks. Adds years to roof life!

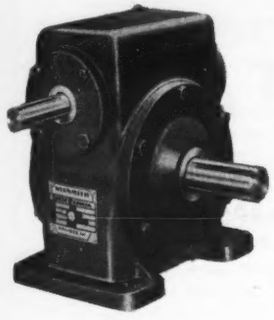
FREE! Complete information, literature, on Tropical Roof Coolerant for comfort and roof protection THIS SUMMER. Write today!

TROPICAL PAINT COMPANY
1128-1278 W. 70th • Cleveland 2, Ohio
HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883

When inquiring check CP 7098 opposite last page

More capacity in less space featured by worm gear speed reducers

Developed to provide greater capacity within more compact dimensions, company's "C" line of worm gear speed reducers consists of three designs ("CB," "CT," and "CV,"), in 13 sizes each. First five sizes, within the 1/100 to 5 hp range, in ratios of 5:1 to 60:1, are available.



Speed reducers are equipped with gears, bearings, and shafts rated for AGMA Class 1 service. Housings are of one-piece construction And rigidly reinforced to assure secure mounting for vibrationless operation. Surface area of reducers provides ample heat radiating capacity.

(Worm gear speed reducers are products of Winsmith, Inc., Dept. CP, Springville, N. Y. . . . or for more information concerning manufacturer's product reader may simply check CP 7099 on handy form which is located opposite last page.)

Low-pH nonionic cleaner won't corrode aluminum, is rapid degreaser . . .

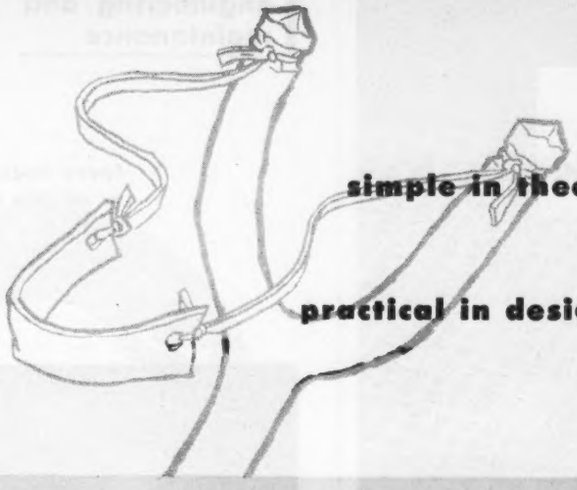
non-toxic, it leaves sweet odor on cleaned vessel

Uses: As a detergent cleaner for industrial, maintenance, and food applications.

Features: Cleaner is a rapid and complete degreaser, showing preferential wetting power against protein soils. It is non-toxic and leaves no residual trace of product on vessel cleaned. A sweet odor is imparted to cleaned vessels. Solution can be used repeatedly. It will not corrode aluminum.

Description: Planisol is a white, granular powder. Highly alkaline, it contains no caustic soda or potash. Chemically it is an alkyl aryl sulfonate condensed onto a silicon nucleus. It is nonionic in character. Despite high solution pH, it will not corrode aluminum.

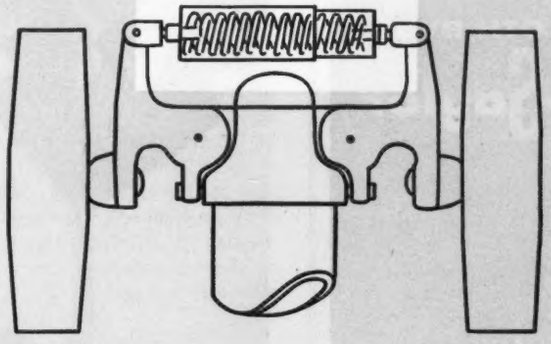
(Detergent cleaner is distributed by The Girdler Co., a Div. of National Cylinder Gas Co., Dept. CP, Louisville 1, Ky. . . . or for more information concerning manufacturer's product reader may simply check CP 7100 on handy form which is located opposite last page.)



simple in theory

practical in design . . .

and LOADED FOR ACTION



New spring loading technique provides positive control during mixing

The best apportioned mixes oft go astray between scale and use.

If *you* mix, and have found that proper formulation, expensive ingredients and careful weighing don't always add up to a uniform batch—you realize too, the need for *controlled* mixing.

With the new F Series Simpson Mix-Muller we've added a new dimension to mulling. With it, *full time* control over mulling pressure is now practical—and simple. Here's how it works:

The muller wheels are suspended to receive pressure through a spring load. Mulling pressures ranging from 1600 to 4000 lbs.* can be brought into action at the turn of a wrench. And what's more, presettings are possible that will increase effective muller pressures as needed, or as the mix builds in strength during the mixing cycle.

If your mix is dry, but not a powder . . . wet but not a fluid, it will pay you to find out more about the new Simpson Mix-Muller. Working for you on an hour by hour and day by day basis, *controlled* mulling can ring up a real savings in more efficient use of all mixture components—declare a dividend in product quality and uniformity. Write for details on a laboratory test on your material, or for our new bulletin on Simpson mulling and remember . . .

MIXING IS OUR BUSINESS—our principal business since 1914.

A new 12 page bulletin providing complete specifications, capacity requirements and industries served by Simpson Mix-Mullers is available on request.

*(on the 60 cu. ft. Mix-Muller)

SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.

(Not Inc.)

When inquiring check CP 7101 opposite last page

You Specify It...
We'll Weave It!

WIRE CLOTH BY
Ludlow-Saylor

Oldest manufacturer of precision wire cloth woven of specified metals for every industrial filtering, straining and sizing operation.

Consult our engineers without obligation

GET YOURS!

Data Book to aid in selecting and ordering wire cloth and screen for every purpose.

LUDLOW-SAYLOR WIRE CLOTH COMPANY
614 South Newstead Avenue, St. Louis 10, Mo.

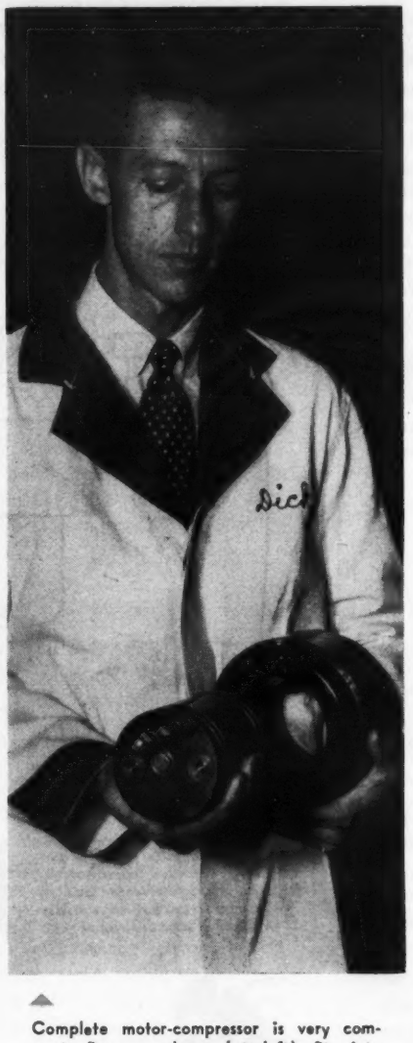
Sales Offices: Birmingham, 921 Euclid Avenue, Chicago, 5807 W. Diversey Avenue, Pittsburgh, Union Trust Building. West Coast: Star Wire Screen & Iron Works, Inc., 2515 San Fernando Rd., Los Angeles. Subsidiary, Ludlow-Saylor Wire Cloth Co.

When inquiring check CP 7102 opposite last page

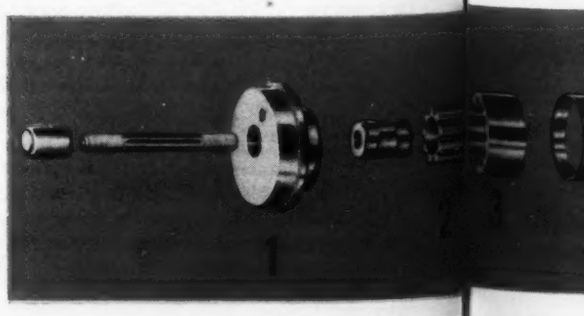
Epoxy resin makes it impervious to all fluids, so stator serves as outside casing for entire unit, and . . .

motor-compressor is smaller by 75 per cent

Unified design cuts dead weight by 60%, uses only 12 parts for easy assembly



Complete motor-compressor is very compact. Pump package (at left) fits into motor stator (at right)



Expanded view of unified motor-compressor showing: 1) discharge end plate: 2) inner gear; 3) outer gear which becomes integral with 4) motor rotor on assembly; 5) suction end plate; and 6) motor stator

High-pressure impregnation of stator windings with a suitably formulated epoxy resin has enabled a motor-compressor manufacturer to utilize the motor stator as the outer casing for the entire compressor unit. Thus, the stator structure itself becomes a fluid-tight pressure vessel which will hold refrigerant vapor pressures up to 350 psi without leakage, and withstand temperatures from −20 to 250°F. This has engendered a gear-type motor-compressor design which is smaller and simpler, but just as effective as conventional units of equal capacity.

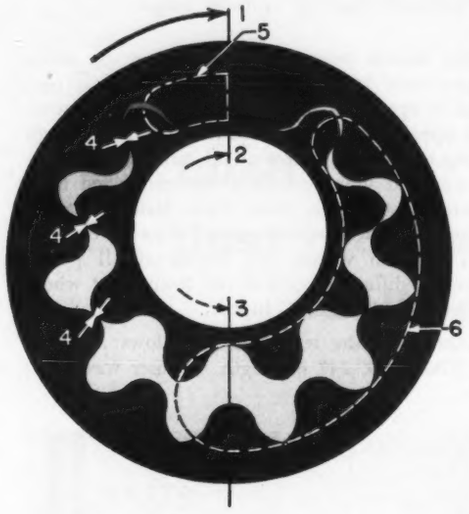
By placing the actual compressor mechanism inside the electrical driving members, it has been possible to reduce the overall size of the unit by 75% or to one-quarter that of conventional units. Sixty per cent of the usual dead weight has been eliminated. Only 12 parts are needed instead of 110, and assembly is much easier.

Another design principle adding to the unit's effectiveness is the use of the ring

Compression Design-principle

1. Outer gear direction of rotation
2. Inner gear direction of rotation
3. Direction of force closing contact areas between teeth. Inner idler gear's resistance to rotation is proportional to compression ratio
4. Lines of contact between mating teeth. Contacts are maintained through 240° rotational arc and provide isolated compression cavities
5. Discharge port. Full mesh occurs at forward edge of port
6. Inlet port. Covers area where tooth cavities are expanding.

Color shows fluid at intake pressure (lightest area) progressing to discharge pressure (solid color)



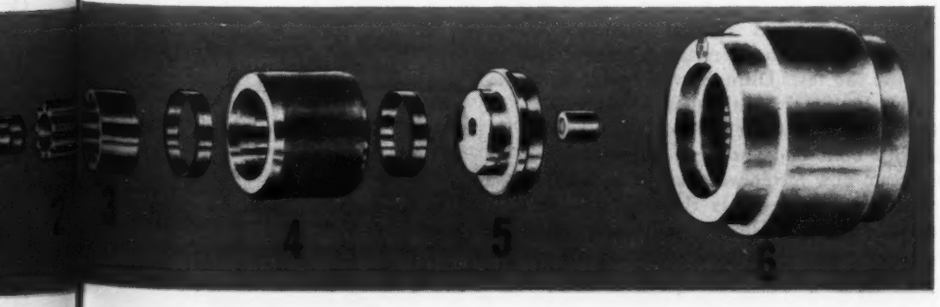
gear to drive the inner pinion. Thus, a positive seal is obtained at the *back* of each pinion tooth rather than the front. Contact is first established 120° before full mesh of the gears. This contact remains unbroken through the full-mesh point and continue 120° after full mesh. There is no possibility of fluid leakage, or "back up", during the operation. Highest possible compression is obtained.

The inner gear has nine teeth and is driven by, and rotates within, the outer gear which has eleven teeth. The effect is that of an eleven-cylinder compressor. Continuous fluid movement is assured since there are 316 "overlapping" discharge impulses per second when the compressor is operating at 1725 rpm. The ½ hp unit displaces 1.5 cu ft/min. Operation is smooth and virtually vibrationless.

Although this motor-compressor has no commercial status as yet, it is expected to find applications in many fields. Developed primarily for refrigeration applications, its small size and light weight will make it useful as a submerged fuel, liquid, or vacuum pump. Where hazardous fluids are handled, the compressor eliminates the dangers of explosion and contamination, and so could be used with radioactive materials and highly volatile fuels.

(Epon epoxy resins used to impregnate stator are a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N.Y. . . . or for more information check CP 7103 on handy form opposite last page.)

(Motor-compressor is a development of Wetmore Hodges Associates, Dept. CP, 806 Chestnut St., Redwood City, Calif . . . or for more information check CP 7103A on handy form opposite last page.)



Performing Seal!

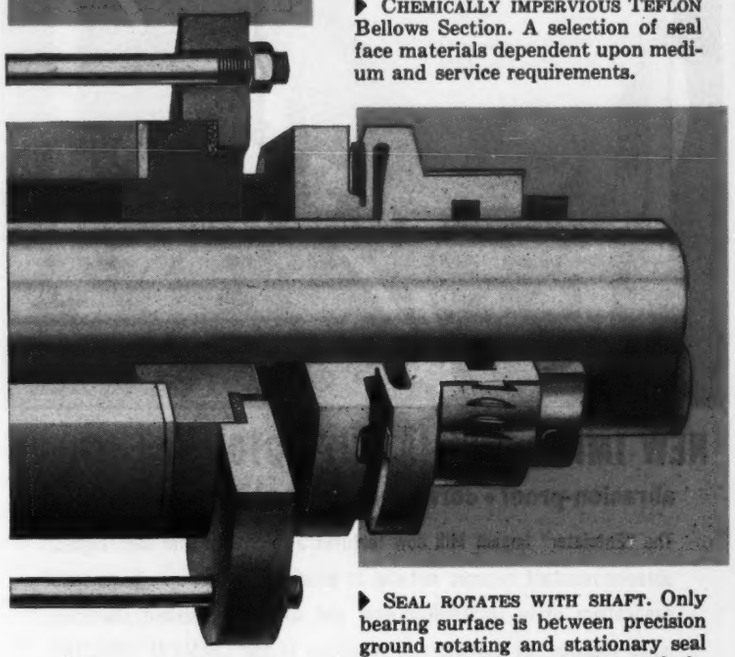
Service that no other Mechanical Seal can match

Pump difficult chemicals...with drop-tight service over longer periods of time. That is what Chemiseal's chemically impervious TEFLON, pressure-balanced bellows design offers you.

The ideal Mechanical Seal that has no equal in handling acids, alkalies, solvents, hydrocarbons, alcohols—clear liquids, slurries and tarry materials.

FEATURES

▶ CHEMICALLY IMPERVIOUS TEFLON Bellows Section. A selection of seal face materials dependent upon medium and service requirements.



made of du Pont TEFLON

▶ SEAL ROTATES WITH SHAFT. Only bearing surface is between precision ground rotating and stationary seal faces. Low friction load on shaft. Lower power cost. Drop tight service.

▶ NO SCORING OF SHAFTS and Chemiseals work satisfactorily on shafts previously scored by other seals or packing.

▶ PRESSURES at the seal up to 100 psi at 75°C or 75 psi at 100°C.

▶ SIZES from ⅛" to 2⅛". Other sizes for special applications.

▶ MAXIMUM LENGTH, all seals 2¾".

Write for Bulletin No. MS-954.

UNITED STATES GASKET COMPANY, CAMDEN 1, NEW JERSEY

USG FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS

Representatives in principal cities throughout the world

When inquiring check CP 7104 opposite last page

for IMPROVED PARTICLE SIZE REDUCTION...

NEW IMPACT-RESISTANT ROTOR and LINER!

abrasion-proof • corrosion resistant • chemically inert

The **"Entoleter" Impact Mill** now features a rotor and liner with highest abrasion-resistant ceramic material at **points of impact** . . . commercial applications prove outstanding wear and corrosion resistant characteristics required for particle size reduction in the CHEMICAL INDUSTRY.

For further information concerning lower maintenance costs on particle size reduction or ingredient dispersion . . . fill in the coupon below:

Name.....**Title**.....

Company.....**Street**.....

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TYPE OF MATERIAL PROCESSED.....

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☐ **I am sending a sample of our product (5-25 lbs.) to your laboratory for free processing on the new "ENTOLETER" IMPACT MILL with the new rotor and liner.**

The trademark "ENTOLETER" is your guarantee of complete satisfaction

ENTOLETER DIVISION
The Safety Car Heating & Lighting Company, Inc.
1169 Dixwell Ave. New Haven 4, Connecticut

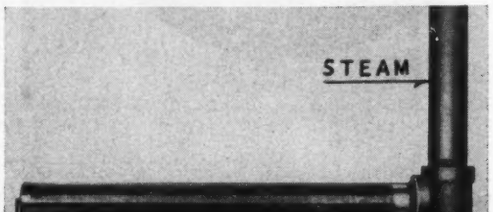
When inquiring check CP 7105 opposite last page

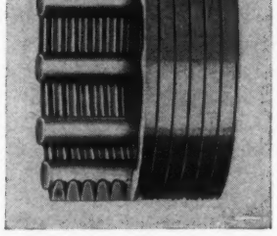
Speedy, noiseless heating of open water tanks . . .

spiral design of V-groove diffuser provides thorough mixing, uniform temps

Photos shown below illustrate design of steam diffuser used for introducing steam directly into water in open-tank heating. Continuous V-groove, with opening of 0.006", found to give thorough mixing and overall uniform tank temperature without noise or vibration. In a test conducted by a research institute in New York State, a vapor-pressure indicating thermometer showed temperatures uniform within one degree at all points above the diffuser except at the steam inlet where the temperature was 2° higher.

Conditions of the test were as follows: Diffuser was 2.067" ID, 24" in length. Diffuser was 16 sq



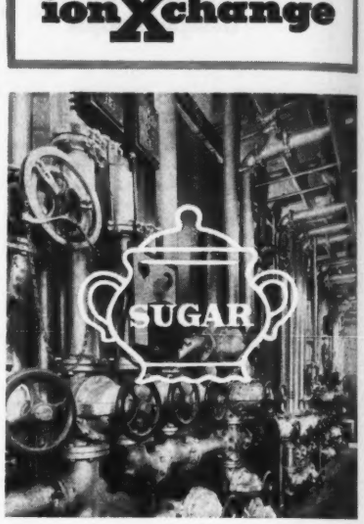


Continuous V-groove steam diffuser, with opening of 0.006" provides rapid mixing and uniform water temperature throughout tank, according to recent tests conducted by a research institute of New York State. Close-up at left shows the heavy-duty lateral bars within diffuser to provide full rigidity

in of open area made up of 0.006" spacer slots. Unit was connected to 90 psig steam supply line with 2" standard pipe. A 270 gal cylindrical insulated tank (3.5 ft in diameter and 3.7 feet deep) was used for the test. Diffuser was mounted ten inches above bottom of tank. (Manufacturer recommends installation about 3 to 4" from bottom of tank with both ends properly supported.) A Foxboro steam flow meter was used to control the steam when the diffuser was throttled to affect temperature control. A Brown indicating vapor pressure thermometer was used to determine the temperature at the various points in the tank.

ILLCO-WAY

ionXchange



NEW WAY TO PURIFY CANE OR BEET SUGAR

As an example of how ionXchange methods can be adapted to various purposes, consider the success accomplished over recent years at a large western sugar refinery. Results show that ionXchange can substitute for sulfur bleaching in beet-sugar refining, or can take the place of bone-char decolorization in the purification of cane-sugar.

LOWER COSTS • PROCESS FLEXIBILITY
INCREASED YIELDS • HIGHER PURITY

All these advantages have been gained in this installation. Details will be furnished on request. *The significant feature is that ILLCO-WAY ionXchange CAN be used for many purposes — and our long experience with practical designs CAN help you to obtain successful solutions of your own problems.* Be sure to consult your ILLCO-WAY representative at every opportunity.

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NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N.Y.
CANADIAN DIST: PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 7106 opposite last page

Capacity of the diffuser tested was found to be between 6000 to 7000 lb/hr of steam at 90 psig. Diffuser operating at maximum capacity provided excellent agitation and mixing in the 270 gal tank without splashing or bumping. When throttled down to 64 lb/hr (about 1/100% maximum heating up flow) diffuser was quiet, provided good mixing with sufficient agitation to maintain a uniform 180° F temperature.

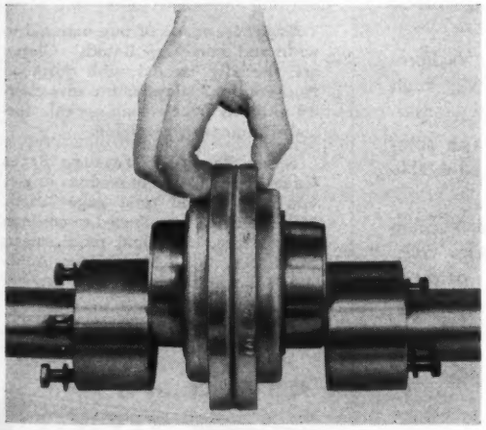
Standard units are manufactured in Everdur (copper silicon alloy) or 304 stainless steel, 1¼" and 2" diameter, lengths 12, 18, and 24"; capacities to 150 gpm at 100 lb steam and 100°F temperature rise. Also available in 316 stainless steel, diameters up to 3" and lengths to 15 ft.

(V-groove steam diffuser is a product of O'Brien Steam Specialty Co., Inc., Dept. CP, P.O. Box 217, Eastwood Station, Syracuse 6, N. Y. . . . or for more information check CP 7107 opp. last page.)

Affords easy disconnection and connection of shafts — spacer coupling

Uses: Between motors and pumps (where gap between shafts must be provided to permit removal of pump impeller shaft assemblies) or on any application where a large gap cannot be avoided.

Features: Spacer coupling affords easy connection and disconnection of shafts (see photo) without disassembling the coupling.



Description: Unit design offers protection against damage from impact loads and shaft misalignment. Because spacer coupling is prelubricated, maintenance lubrication is required only once every six months.

(Type F Steelflex spacer coupling is a product of Dept. 361, The Falk Corp., Dept. CP, 3001 W. Canal St., Milwaukee 8, Wis. . . . or check CP 7108 opposite last page.)

buell
dust recovery
really pays off, too!

BUELL ENGINEERS help you to get greater "returns" from your valuable industrial dusts because they deal in FACTS! Important, too, they give you *all* the facts before your company invests a cent.

WITHOUT OBLIGATION...Buell Engineers submit samples of your valuable dust to their laboratory for analysis...make a thorough, on-the-spot study of your operations!

THEY RECOMMEND from the complete line of Buell Dust Recovery Equipment the unit, or combination of units... that is most suitable for your operating conditions.

BUELL "SF" ELECTRIC PRECIPITATOR with its exclusive "Spiralectrodes" and continuous cycle rapping! Buell Cyclone Collector with its exclusive "shave-off" design! Buell PMV Non-Returning Hopper Valves with their positive sealing and self-cleaning features! These are just some of the reasons why Buell Engineers can offer you the ultimate in valuable dust recovery.

THEY TELL YOU EXACTLY HOW MUCH valuable dust can be recovered from your operation . . . before you become obligated in any way!

WHY WAIT? With "profits" to gain...nothing to lose...why not take advantage of this generous proposition right away?

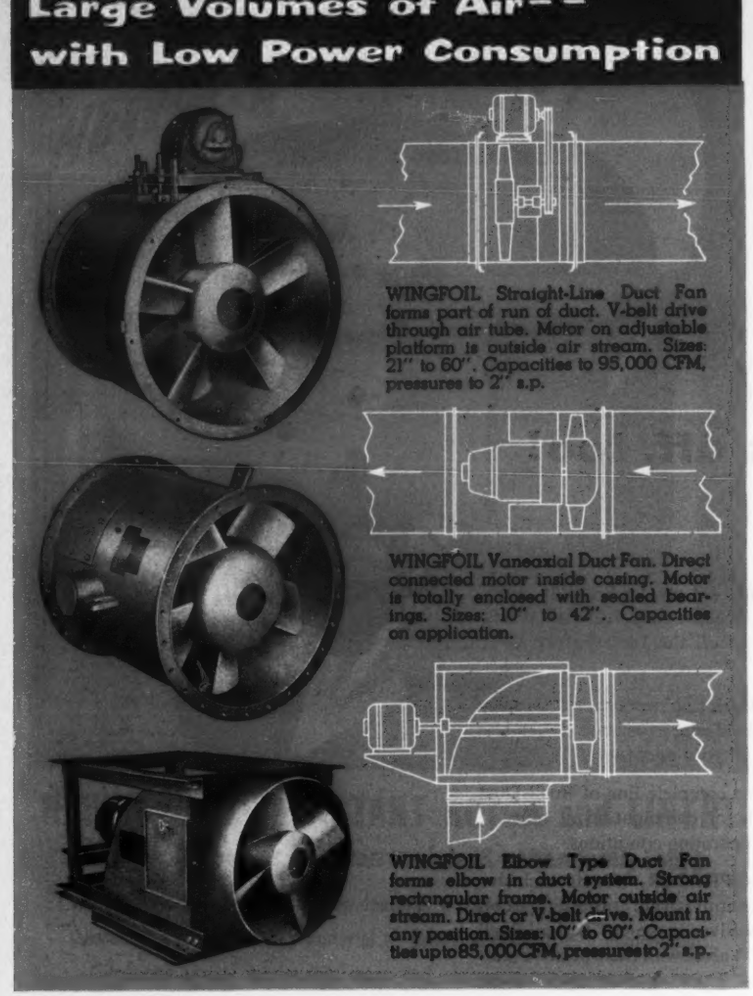
WRITE TODAY for free booklet: The Collection and Recovery of Industrial Dusts—which clearly explains *all three* Buell Systems. Dept. 11-E, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

buell®

MECHANICAL ELECTRICAL *20 Years of Engineered Efficiency in* **DUST RECOVERY SYSTEMS**

When inquiring check CP 7109 opposite last page

Large Volumes of Air-- with Low Power Consumption



WINGFOIL Straight-Line Duct Fan forms part of run of duct. V-belt drive through air tube. Motor on adjustable platform is outside air stream. Sizes: 21" to 60". Capacities to 95,000 CFM, pressures to 2" s.p.

WINGFOIL Vaneaxial Duct Fan. Direct connected motor inside casing. Motor is totally enclosed with sealed bearings. Sizes: 10" to 42". Capacities on application.

WINGFOIL Elbow Type Duct Fan forms elbow in duct system. Strong rectangular frame. Motor outside air stream. Direct or V-belt drive. Mount in any position. Sizes: 10" to 60". Capacities up to 85,000 CFM, pressures to 2" s.p.

WINGFOIL DUCT FANS are your best bet, because of their strong, light-weight, rugged design, and the highly-efficient Wingfoil axial flow fan, which delivers high air volumes against static pressures with remarkably low power consumption.

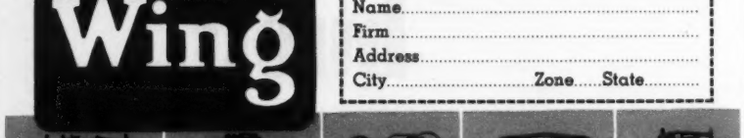
The three types of duct fan, shown above, come in a wide variety of sizes and capacities. They are designed to handle hot or cold, dust-laden or corrosive air or gases and for exhausting or supplying air. *Write for Bulletin. Use the coupon.*

L. J. Wing Mfg. Co. 179 Vreeland Mills Road, Linden, N. J.

Factories: Linden, N.J. & Montreal, Can.

Wing

L. J. Wing Mfg. Co., Linden, N. J.
Please send me bulletin on WINGFOIL DUCT FANS.
Name.....
Firm.....
Address.....
City.....Zone.....State.....



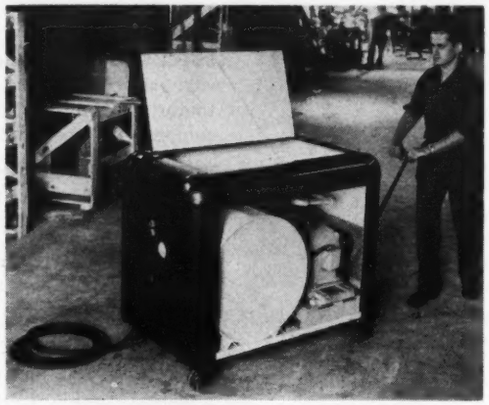
When inquiring check CP 7110 opposite last page

Many applications seen for vacuum pump that's mobile . . .

unit can be used where needed in plant, plugs into ordinary electrical outlet

Uses: In vacuum applications such as presses, sealers, concentrators, driers, molding units.

Features: Unit is housed in a protective metal cabinet with removable panels and, being mounted on rubber-tired wheels, can be moved to point of use by one man. When in place, pump is connected by heavy-duty hose to whatever equipment is to be used, and wheels are locked in place to prevent sliding or slipping. Pump is then ready for action when plugged into an ordinary electrical connection. Pushbutton controls stopping and starting.



Wheels lock to keep pump wagon in place

Description: Vacuum pump, called the VacForm Mobile Pump Wagon, weighs 900 lb, is 3½′ high and requires only 4 x 2½′ of floor space.

Unit includes an air-cooled rotary jump with automatic lubrication, a vacuum gage, and an adjustable vacuum shutoff switch.

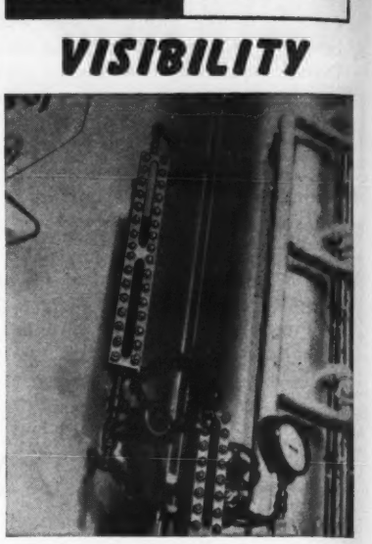
(Mobile Vacuum Pump is a product of Vacuum Forming Corp., Dept. CP, 76 South Bayles Ave., Port Washington, Long Island, N. Y. . . . or check CP 7111 on handy form opposite last page.)

High-pressure jet of solvent cuts tough scale

Eight case histories of tough jobs successfully handled by high-pressure jet of solvent are described in two-page bulletin on chemical cleaning.

"Faster Cleaning with Pressure Jets" is available from Dowell Incorporated, Dept. CP, P. O. Box 536, Tulsa 1, Oklahoma. When inquiring specify CP 7112 on handy form opposite last page.

BLACK WHITE VISIBILITY



Factory Mutual Approved

JERGUSON Series #5 Reflex Gages Give you up to 19¼" of Clear Visibility

THE sharp black-white contrast of the level of any color liquid, against the empty space above, in Jerguson Series #5 Reflex Gages, makes possible highly accurate liquid level readings even where lighting is poor.

Gages are made of any material to withstand corrosive liquids. Glasses are specially treated with Jerguson Anti-Fouling Compound to give clearest visibility over a long period. Special illuminators available.

Series #5 Low Pressure Reflex Gages are available in sections to give you any desired total gage length. Materials used are selected to conform to or exceed the rigid requirements of A.I.S.I., A.S.T.M., and/or A.P.I.-A.S.M.E. specifications.

You can depend on Jerguson Gages. Write today for full information on Series #5 Gages, or for help on any gage problem.

JERGUSON

Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.
Offices in Major Cities
Jerguson Tress Gage & Valve Co., Ltd., London, Eng.
Pétrole Service, Paris, France

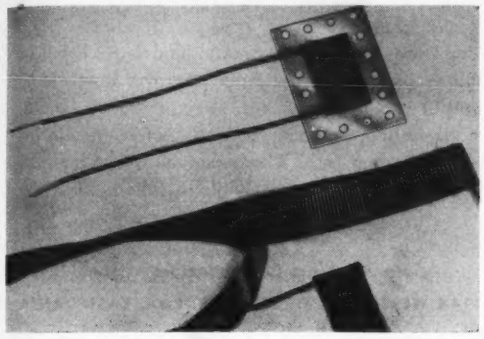
When inquiring check CP 7113 opposite last page

Installation where needed permitted by flexibility of heating elements . . .

rubber- and fiberglass-insulated units can operate under pressures of 100 psi

Uses: From maintaining temperature in mechanical and electrical apparatus to supplying heat necessary to cure thermosetting cements.

Features: Thinness (0.100" or less) and flexibility of elements allow installation at place of need. They are light in weight and able to operate under pressures in excess of 100 psi.



Standard heating elements are available in a variety of sizes

Description: Insulation used on flexible heating elements is silicone rubber and fiberglass cloth. For ease of mounting or for the purpose of reducing flexibility, elements are also offered with a perforated stainless steel backing. Assembly can withstand continuous operation at temperatures in excess of 450°F.

Pre-engineered standard elements range in size from 1 x 1½" overall to 24 x 42". Resistance variation is infinite throughout a wide range; tolerance is plus or minus 7%.

(Flexible electric heating elements are products of Electro-Flex Heat, Inc., Dept. CP, 1516 Asylum St., Hartford 5, Conn. . . . or for more information check CP 7114 on handy form opposite last page.)

No turning or twisting to lock quick-acting coupling

Line of quick connect and disconnect hose couplings, featuring one-hand operation without turning or twisting to lock, is described in eight-page bulletin.

Bul 54-1R is available from Breco Division, Perfecting Service Company, Dept. CP, 332 Atando Avenue, Charlotte, N. C. When inquiring specify CP 7115 opposite last page.

Case No. 63

Kemp Oriad Dryer Gives "Most Satisfactory Service" Guarding Spencer Control Board

How Kemp assures round-the-clock operation at Spencer Chemical

The Spencer Chemical Co., Charlestown, Ind., operates 24 hours a day, 7 days a week, making nitrogen compounds for the fertilizer industry. Heart of this operation is the master instrument board that controls all plant processes. These instruments are operated by compressed air, which must be dried to prevent rust and corrosion within the controls.

Kemp Offers Continuous Protection

Spencer uses a Kemp Oriad Dryer to dry all the air required and completely protect the delicate instruments from moisture damage. Since its installation in 1950, this Kemp unit has needed no service of any kind. And Spencer is delighted with Kemp's ease of operation! Mr. N. S. Whitaker, Works Manager, commenting on Kemp's "most satisfactory service," says, "Operation is simplicity itself. All we have to do is switch a lever once a week. Capacity is ample for one week of maximum flow, on a 24-hour 7-day operation."

Kemp Dryers for Every Purpose

Kemp offers a variety of dryer models to meet all problems. Designed to dry air to sub-zero dew points at low cost, these efficient dryers embody the engineering knowledge gained from Kemp's many years of experience. They are available with manual, semi-automatic, or fully automatic tower reactivation. In addition, Kemp will prescribe the proper desiccant for each specific drying job. If you have a problem involving the drying of air, gases, or liquids, contact Kemp engineers now.

Only operation required on Kemp Oriad Dryer is moving lever once a week to switch flow of air to second column. First column is reactivated by heat during the week.

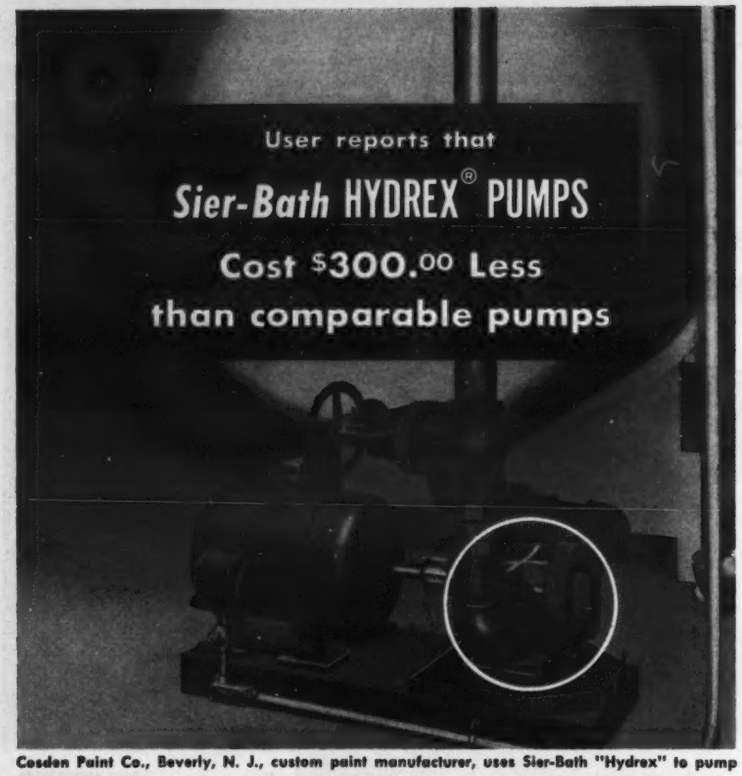
For more complete facts and technical information, write for Bulletin D-27 to: THE C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP OF BALTIMORE

DYNAMIC DRYERS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • INERT GAS GENERATORS
SINGEING EQUIPMENT

When inquiring check CP 7116 opposite last page



Cosden Paint Co., Beverly, N. J., custom paint manufacturer, uses Sier-Bath "Hydrex" to pump 15,000 SSU resin from storage to plant at 1150 RPM. Cosden reports that the "Hydrex" cost about $300.00 less than comparable pumps . . . does a very good job of pumping . . . has less parts, fewer lubricating points, and requires less space.

Sier-Bath HYDREX PUMP

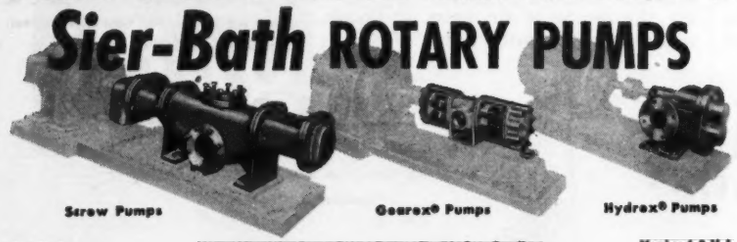
Only 2 castings
Only one stuffing box (under suction pressure)
Hydraulically balanced axially
Heavy duty roller bearings
Precision manufactured rotors
All machined surfaces ground

The simplest heavy duty gear pump made! Use it in place of pumps costing much more . . . for handling chemical solutions, fuel oils, lube oils, hydraulic liquids, etc.

The "Hydrex" needs no costly speed reducer—can be direct-connected up to 1800 RPM. Extreme simplicity allows heavier construction, easier installation and maintenance, less downtime, longer life.

Models available to pump liquids from 32 SSU to 250,000 SSU, at 1 to 350 GPM, up to 500 PSI. Call your local Sier-Bath Pump Representative . . . write to *Sier-Bath Gear & Pump Co., Inc., 9260 Hudson Blvd., North Bergen, N. J.*

Sier-Bath ROTARY PUMPS



50th Anniversary — Mfrs. of Precision Gears, Rotary Pumps, Flexible Gear Couplings — Member A.G.M.A.

When inquiring check CP 7117 opposite last page

Handles 2 million cu ft compressed air without change of element . . .

filters in separator designed for constant use

Uses: High-capacity moisture, dirt and oil separation on compressed air lines and equipment.

Features: Equipped with four Sta-Dri cellular filters, unit is designed to handle 2 million (or more) cubic feet of compressed air without change of filter elements. Filters are designed for long, constant use without plugging from "mushing".

Description: Moisture and oil separator unit has been added to company's line of compressed air separator equipment to provide a 125 cfm (at 100 psi) model. Unit is fabricated from 3" wrought iron pipe and fittings and is hot dipped galvanized inside and out to resist corrosion. It is designed for ½" pipe connections.

(Model 125S moisture and oil separator is a product of Beach Precision Parts Co., Dept. CP, 120 Mechanic St., Boonton, N. J. . . . or for more information check CP 7118 on handy form opposite last page.)

General properties, uses of foam-in-place resins

Two technical service bulletins are devoted to descriptions of foamed-in-place isocyanate resins. First bulletin, on Urefoam, presents a brief outline of the properties of product and suggested applications in industry.

Second bulletin, on Urefoam R, discusses specific properties of this resin and gives instructions for its use. Tables and graphs accompany text.

Bul 5-60A on Urefoam and Bul 5-61A on Urefoam R are available from The Atlas Mineral Products Company, Dept. CP, 26 Walnut St., Mertztown, Pa. When inquiring specify CP 7119 opposite last page.

BOOST 100 PSI AIR PRESSURE TO 30,000 PSI FLUID PRESSURE

for...

$289.50

(F.O.B. Gardena, Calif.)

Continuous-acting, air-driven. Various ratios give maximum fluid pressures of 100 to 50,000 psi. Size: 8¼" wide x 9⅝" deep.

Eight standard models. Special models for lower or higher pressures. Applicable wherever low-volume output at high pressures is the requirement, such as static testing, powering presses for forming, shearing, clamping, etc. Thousands in use. Complete power packages also available. Send for Bulletins.

SPRAGUE
Engineering Corporation

• 1144 WEST 135th STREET, GARDENA, CALIFORNIA •

When inquiring check CP 7120 opposite last page

PISTON PACKING PROBLEMS SIMPLIFIED!

Conventional and 45° bevel type Pumcups.

• The *right* piston packing for reciprocating pumps and cylinders goes a long way toward eliminating the problems of slippage, maintenance and down-time.

Because Darcova Pumcups are made in a complete range of sizes, various types, and in many texture-engineered compositions, they *fit* your temperature-pressure-fluid conditions. That's one important reason why they usually outlast other packing at least 3 to 1 while holding top efficiency to the last!

Why not get *all* the facts? Send today for Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.

DARCOVA — THE ORIGINAL COMPOSITION CUP

TRADE MARK **PUMCUPS**

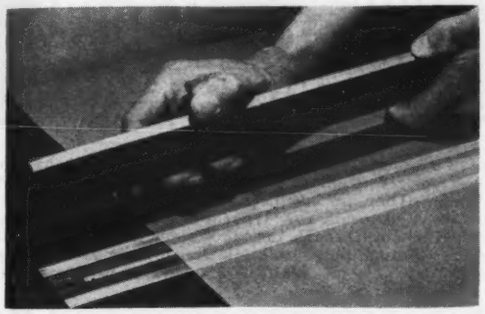
When inquiring check CP 7121 opposite last page

Large areas of plastic sheeting welded by bar electrode . . .

all overhead structures of presses eliminated

Uses: Welding of large areas of plastic sheeting.

Features: Electrode incorporates all functions of conventional presses. Plastic sheeting can be wrapped around keeper bar for production of unlimited lengths of plastic tubing for packaging and other requirements. All overhead structures of presses are eliminated.



All functions of presses are incorporated in plastic-welding electrode

Description: Plastic-welding electrode, called the Ectromag Magnetic-Bar Electrode, has a box-like steel magnetic structure which completely encloses the radio-frequency electrodes. Magnetic coils mounted below draw a free keeper bar downward when energized to apply welding pressure for plastic sheeting against electrode. Pressure is adjusted by adjustment of voltage through magnet-actuating coil circuit.

Unit design permits use of unusually long electrodes with even pressure throughout their length. Keeper bar can be made either rigid or semi-rigid as required. Heat-sealing applications can also be handled to advantage. Each unit is made to requirements.

(Plastic-welding electrodes are products of Electronic Processes Corp., Dept. CP, 1047 San Antonio Road, Los Altos, Calif. Check CP 7122 opposite last page.)

Technical data catalog covers stainless steel tube fittings

Application, installation, and performance data on company's line of stainless steel flared tube fittings are presented in 14-page catalog. Other information covers stainless steel connectors, bulkhead unions, crosses, solder fittings, and lap joint stub ends.

Cat K-954 is available from The Special Screw Products Co., Dept. CP, 5445 Dunham Rd., Bedford, Ohio. Specify CP 7123 on handy form opposite last page.

Rugged, lightweight 6' sections are amazingly easy to handle.

New BETTER way to insulate BIG pipe

GUSTIN-BACON SNAP*ON

Recently, more than a mile of large 250° pipe was insulated at an eastern refinery in record time and at unprecedented low cost. The key to the success of the installation was revolutionary G-B Snap*On pipe insulation—one-piece molded cylinders of fine glass fibers.

Photos tell the story. Lightweight 6' sections of 20" Snap*On, 1½" in wall thickness, were hoisted to the job by a man with a rope. Unlike segmental pipe insulation, Snap*On required no springs or special tools for application. Two men accomplished the job quickly by snapping Snap*On sections snugly around the pipe and tracer line. A weatherproof jacket was applied in accordance with standard practice for outdoor installations. There was no breakage or waste, for flexible, resilient Snap*On is tough, does not break or crumble. No clean-up time was involved because Snap*On does not flake or chip.

Next time you have chilled or heated piping to insulate, if you want maximum thermal efficiency, easier application and permanence, specify G-B Snap*On. There is **nothing** like it!

Write for 8-page brochure or see the Yellow Pages for name of your local distributor who carries local stocks of Snap*On.

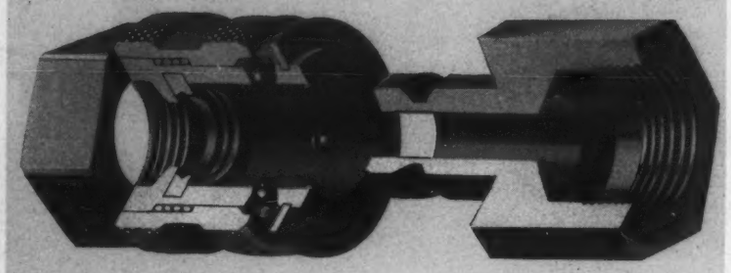
GUSTIN-BACON *Manufacturing Company*

Thermal and acoustical glass fiber insulations • Pipe Coverings and fittings • Railroad gaskets and supplies

254 W. 10th St., Kansas City, Mo.

When inquiring check CP 7124 opposite last page

...to make a leakproof connection



in one second

New, economical Titeflex QUICK-SEAL Couplings are leakproof at *all* operating pressures—provide full swivel action, full free flow, versatility, long service life—couple & uncouple IN ONE SECOND without tools. QUICK-SEAL Couplings are interchangeable in the same size; come in a variety of alloys in many sizes—¼" to 12" diameter. Straight-through, Single and Double Check-valve types. ***Write today for Titeflex* QUICK-SEAL *coupling catalog.***

Titeflex

Titeflex, Inc.
Industrial Products Division
509 Hendee Street
Springfield 4, Mass.

QUICK-SEAL COUPLINGS

Please send your new, free Quick-Seal Coupling Catalog.

Name_____

Title_____

Firm_____

Address_____

City_____ **Zone**_____ **State**_____

The higher the pressure the tighter the seal

When inquiring check CP 7125 opposite last page

High-pressure water where needed with portable pumper

Uses: Wherever and whenever high water pressure is needed.

Features: Pumper is a complete unit, including power supply, pump and filter for supplying fresh or salt water at 300 psi at the rate of 7 gpm.

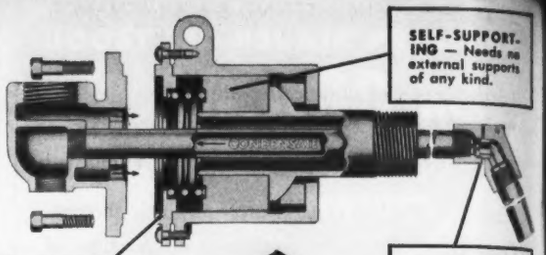
Description: Three models of pumper are available. Model GMS, powered with a 1.6-hp gasoline engine weighs only 30 pounds and is easily carried by means of a handle-bar carrier. Model EMS, powered with an electric motor of 1.5 hp, and Model EMD, powered with a 3-hp motor direct-connected to dual pumps, are also available. The last named supplies 14 gpm at 300 psi.

(Portable pumps are products of Eastman Pacific Co., Dept. CP, 2320 E. 8th St., Los Angeles 21, Calif. . . . or check CP 7125A opposite last page.)

Describe synchronous motors for industrial control

Dimensions, speed ranges, motor shafts, and design data on synchronous motors for instrument and industrial control applications are presented in eight-page bulletin. Line drawings, charts, and photographs illustrate text.

Bul PB-110 is available from The R. W. Cramer Co., Inc., Dept. CP, Centerbrook and Ballouville, Conn. Specify CP 7126 opposite last page.


SELF-SUPPORTING — Needs no external supports of any kind.
ASSEMBLY PLATE — Holds internal parts in position when head is removed.
SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

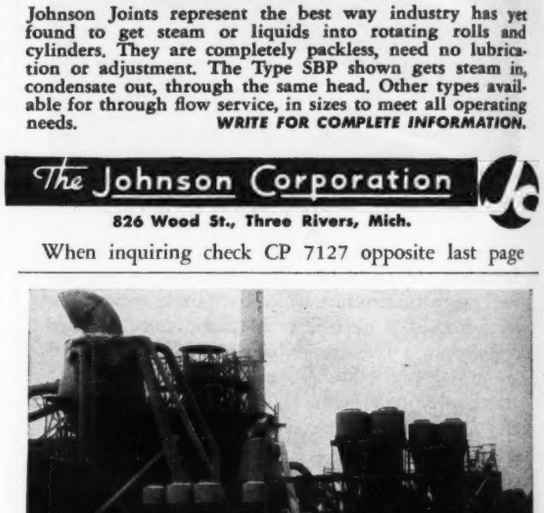
Johnson Rotary Joint *with* SYPHON ELBOW

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs. ***WRITE FOR COMPLETE INFORMATION.***

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 7127 opposite last page



Foreground, DUSTMASTERS. Background, old collectors being removed.

Banister DUSTMASTERS solve large manufacturer's dust problem!

In order to eliminate a dust nuisance and also collect usable product, the company modernized its dust collecting system with Banister DUSTMASTERS. Before replacing the old system, extensive tests were made to determine which equipment would do the job best at a moderate cost.

DUSTMASTERS were selected on the basis of the findings. They have greatly improved product recovery, eliminated a public nuisance, and solved long standing maintenance problems.

Our engineering and manufacturing facilities are at your service. Your inquiries will receive prompt attention. Send for Catalog and material showing how DUSTMASTER Systems solved many so-called impossible dust collecting problems.

A. W. Banister Company, 21 Charles St., Cambridge, Mass.

When inquiring check CP 7128 opposite last page

Compressed air filter has permanent core of Teflon felt . . .

units are rated at 20 cfm flow, pressure of 125 psi

Uses: Mechanical air filter applications.

Features: Filter has a permanent core of cartridge of Teflon felt which is both chemically inert and water repellent. Major advantage of fluorocarbon core is its water repellency which prevents accumulation of water, the major cause of clogging in other materials. Air flow rates remain high since incoming moisture "rolls off" Teflon fibers to collect at base of receptacle for simple removal.

Description: Compact air filters are rated at 20 cfm flow and a maximum operating pressure of 125 psi. Pipe size connections are ¼" IPS.

(Dri-Kleer air filters are products of Porous Plastic Filter Co., Dept. CP, 30 Sea Cliff Ave., Glen Cove, N. Y. . . . or for more information reader may simply check CP 7128A on handy form which is located opposite last page.)

Outline advantages of seamless tube

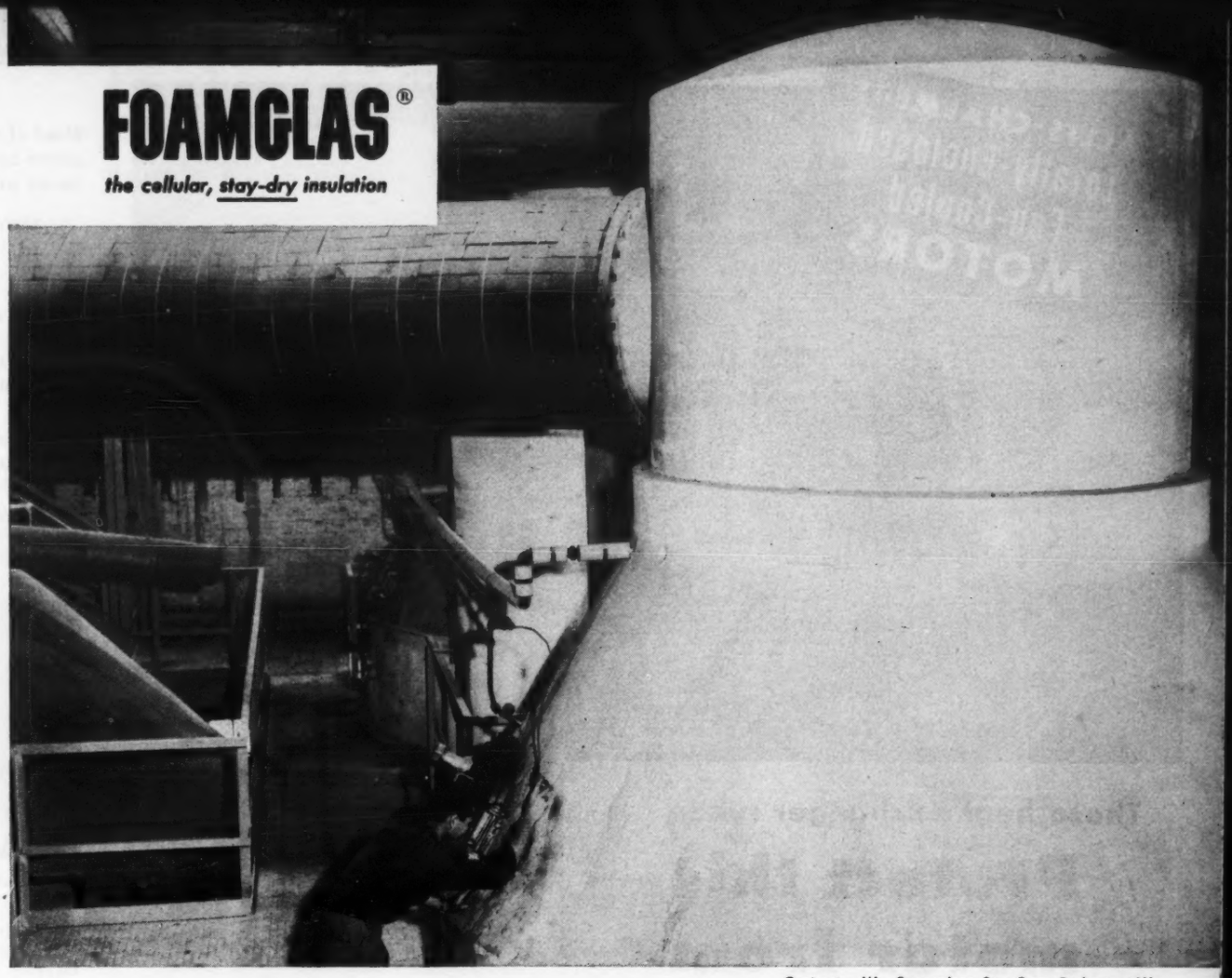
Advantages offered to design and fabrication engineers, who consider tubing in the production of parts and products which they manufacture, are outlined in six-page folder.

In addition to defining the many finishes, size ranges, types, and shapes of stainless tubing available to industry, folder contains a table of condensed properties and processing data for nine grades of stainless tubular products.

Bul TB 365 is available from Tubular Products Division, The Babcock & Wilcox Co., Dept. CP, 4029 4th Ave., Beaver Falls, Pa. When inquiring concerning manufacturer's product specify CP 7129 on handy form opposite last page.

FOAMGLAS®

the cellular, stay-dry insulation



Contractor: Wm. Summerhays Sons Corp., Rochester, N.Y.

FOAMGLAS insulation stays dry, effective and re-usable for International Salt

reports R. B. Richards, Chief Engineer, New York Evaporating Plants, International Salt Co., Inc.

"Our evaporation process requires an insulation that's high in both efficiency and strength," says Chief Engineer R. B. Richards, International Salt Company, Inc., Watkins Glen, N.Y. "That's why we picked FOAMGLAS to insulate our evaporating pans and piping."

Mr. Richards explains, "Moisture-proof FOAMGLAS stays dry and effectively prevents excessive heat loss which would upset the exact temperature-pressure balance our process requires.

"Also we're in the middle of a 4-year construction job, redesigning and renewing our entire evaporation system. Maintaining full production now calls for constant shifting of pipes and lines. The pre-cut shapes of FOAMGLAS are so strong and rigid that we are able to remove them, move the line and re-use the same pieces of insulation."

Pittsburgh Corning Corporation

One Gateway Center • Pittsburgh 22, Pa.

In Canada: 57 Bloor St. W., Toronto, Ontario

Like International Salt Co., producers of Sterling Salt, you too will benefit from the unique properties of this cellular glass insulation. Send the coupon right away.

Pittsburgh Corning Corporation, Dept. CP-55
One Gateway Center, Pittsburgh 22, Pa.

Please send me FOAMGLAS literature on the following:

- ☐ Building insulation
- ☐ Insulation for cold storage space
- ☐ Pipe insulation
- ☐ Insulation for tanks and other equipment
- ☐ Send free sample of FOAMGLAS
- ☐ Send engineer to discuss a specific insulating problem

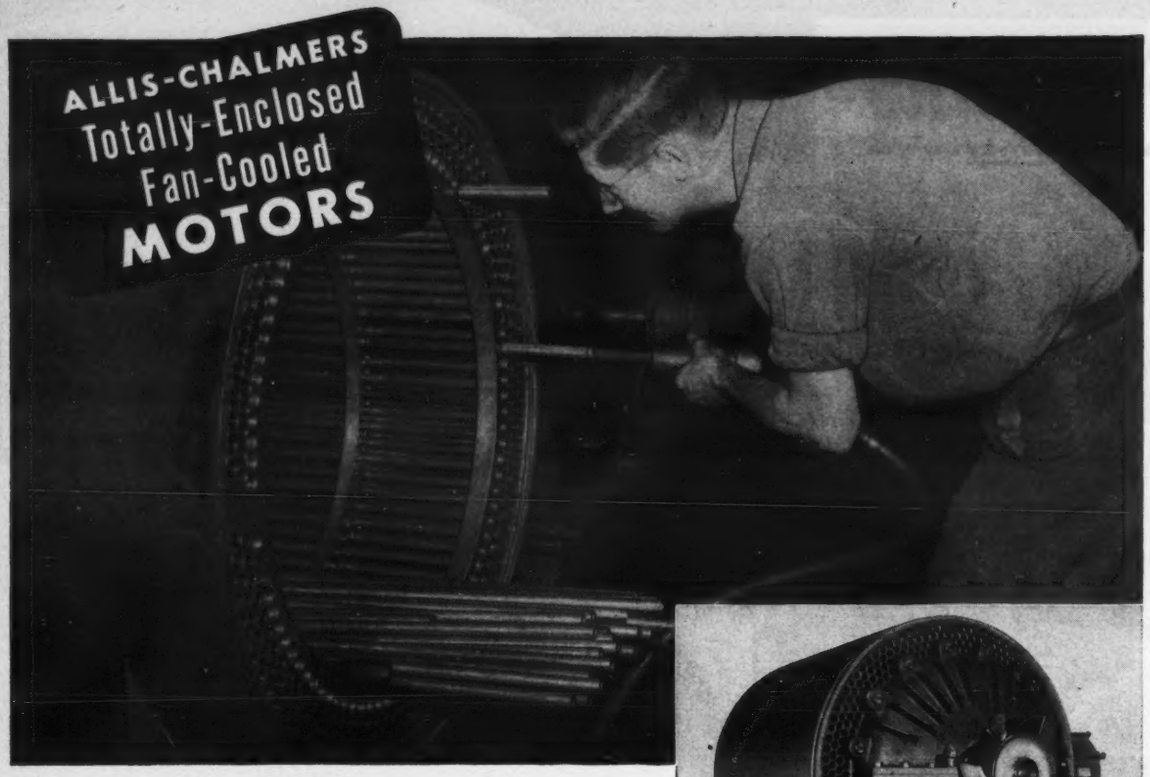
NAME_____

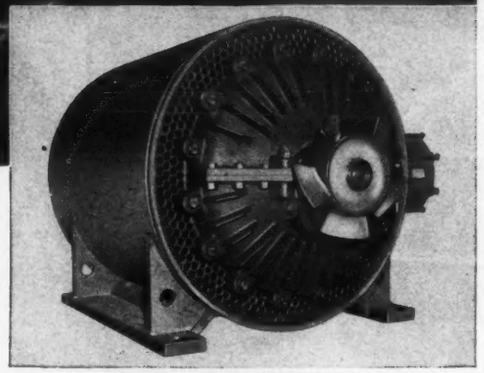
COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

When inquiring check CP 7130 opposite last page





3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

These heat exchanger tubes

Protect this motor from dirt and corrosion

COOLING AIR is carried through the heat exchanger tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length — cooling all parts of the motor evenly.

Choice of Corrosion-resistant Materials

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Get Complete Information

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

A-4559

ALLIS-CHALMERS

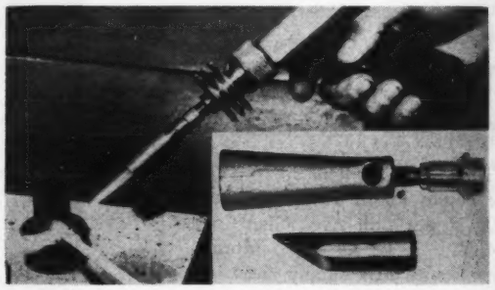
When inquiring check CP 7131 opposite last page

Heat of acetylene at 1/10 cost given by blow torch which burns propane . . .

3650°F flame burns clean with no carbon deposit or "blackened area"

Uses: For small or large heating applications that are within or beyond capacity of blow torches or soldering irons. Heat uses include soldering, tinning, brazing, pre-heating, thawing, plasticizing, and paint removal.

Features: Unit burns clean, low-cost propane with a heat range of 4000 to 117,000 Btu per hour. It operates at about one-tenth the cost of an acetylene torch for the same amount of heat. The 3650°F flame burns clean with no carbon deposit or "blackened area" because burner tips give complete combustion of propane using oxygen from the air.



Uses of heat tool include soldering, tinning, brazing, and paint removal

Description: Portable, hand-operated heat tool kit includes a heat concentrator tip, a high heat or blow torch tip, a soldering iron tip which is equivalent to a 12-lb commercial iron, hose, regulator, pressure gage, and steel carrying box.

(Fire Gun portable heat tool is a product of Fire Gun Sales Corp., Dept. CP, 2500 W. 7th Ave., Denver 4, Colo. . . . or for more information check CP 7132 on handy form opposite last page.)

Equipment for spraying or extruding liquids to semi-solids cataloged

Air-powered Powerflo pumps, circulating systems, and other modern equipment are illustrated and described in 50-page catalog. Equipment is designed for spraying or extruding liquids, semi-liquids, or semi-solids used in production, construction, and maintenance.

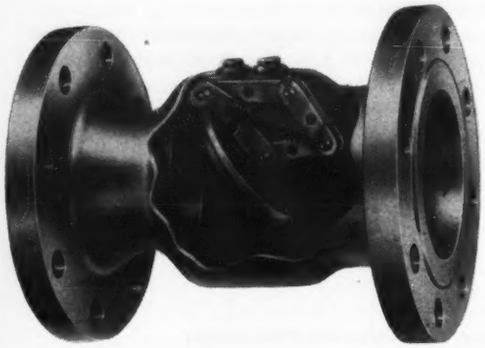
"Graco Powerflo 452 Catalog" is issued by Gray Company, Inc., Dept. CP, Graco Square, Minneapolis 13, Minn. When inquiring specify CP 7133 on handy form which is located opposite last page.

Design principle of check valve eliminates slamming and cuts resistance to flow . . .

spring-actuated flapper closes valve before reverse flow starts

Uses: Check valve applications on 4, 6, 8" diameter fluid-carrying lines.

Features: Unit incorporates a knuckle joint with spring action to eliminate slamming and minimize flow resistance. Spring tension on flapper closes valve an instant before reverse flow starts. Closing force can be controlled by changing characteristics of springs.



Valve uses knuckle joint with spring action

Description: Flapper on check valve is faced with neoprene. For special applications, other materials are available. Valves operate efficiently in any position. Internal working parts are of stainless steel and are easily accessible for inspection or replacement. Bodies are available in aluminum, stainless or galvanized steel, with flanged or threaded ends.

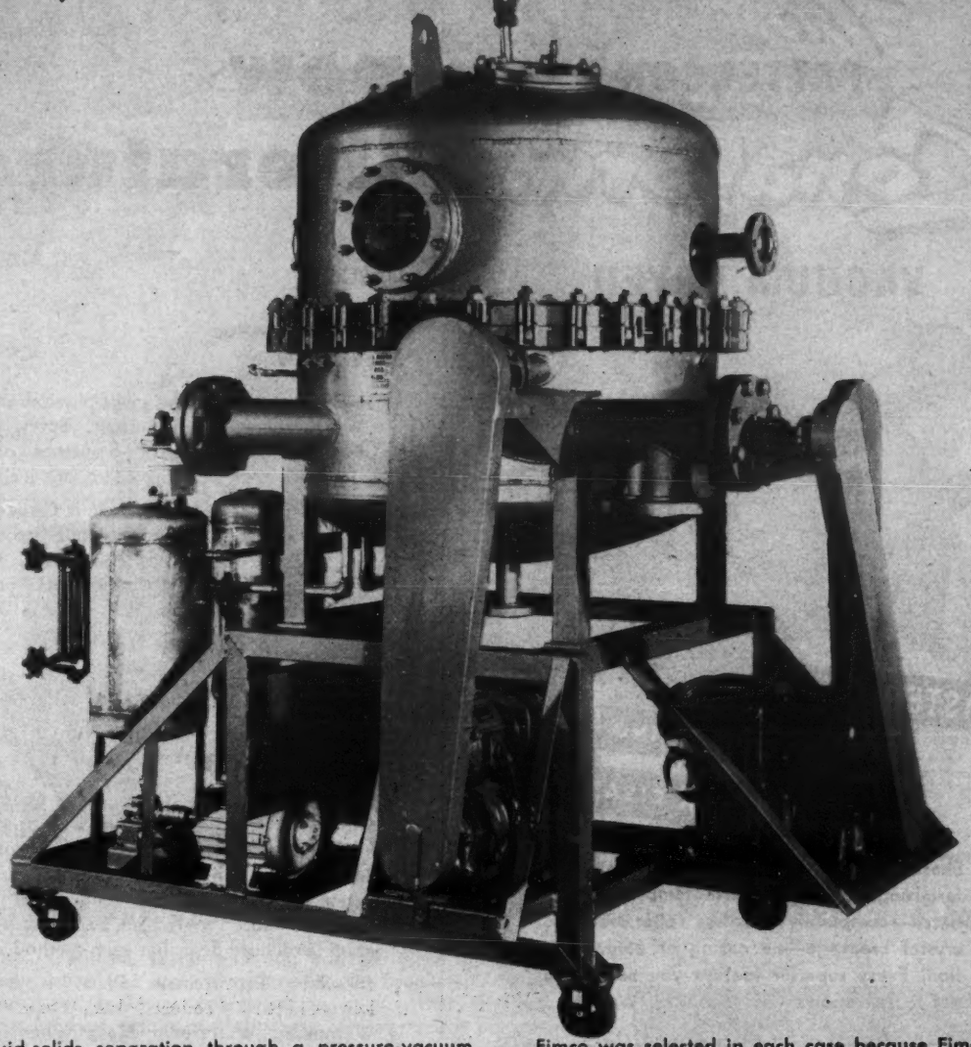
(Check valves are products of W. R. Ames Co., Dept. CP, 150 Hooper St., San Francisco, Calif. . . . or check CP 7137 on form opposite last page.)

Documents advantages of pumps for process and transfer

Many construction features of both a process and a transfer vertical can pump are documented and illustrated in twelve-page bulletin. Applications where each may be advantageously applied are pointed out. Flexibility, space-saving qualities, and design characteristics of these encased, vertical, close-coupled pumps are explained. Photos of typical applications are included.

Bul B-1700 is available from Peerless Pump Division, Food Machinery and Chemical Corp., Dept. CP, 301 West Avenue 26, Los Angeles 31, Calif. Specify CP 7138 opposite last page.

Complete Continuous Pressure Filter Station



Liquid-solids separation through a pressure-vacuum differential has many applications in chemical processing.

Eimco designed, tested and approved pressure vessels of this type have found wide acceptance in many different kinds of jobs. Some of these use heat and others use inert gas. Some of the jobs involved combustible materials and others non-combustibles.

All of the installations are classified as far as Eimco is concerned to protect the customer's process or his idea and his flow sheet.

Eimco was selected in each case because Eimco's experience in the field of filtration is unsurpassed and Eimco's ability to engineer into each filter that extra quality that provides for greater product recovery and greater profits for the user.

Let Eimco's Research and Development Center tackle your filtration problem. You will have the benefit of work by some of the best technologists in the industry, plus complete pilot plant data. Eimco backs the recommendations of its Research Center by a guaranteed performance.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

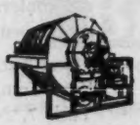
New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Pasadena, Calif. Houston, Texas London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-103

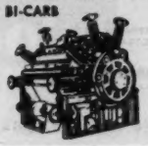
BURWELL

CONTINUOUS PRESSURE

AGIDISC



BI-CARB



PRESSURE PRECOAT

PAN

When inquiring check CP 7139 opposite last page

The PATTERSON Conaform VACUUM DRYER

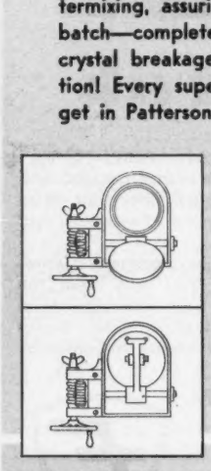
FASTER DRYING

GENTLER HANDLING

EASIER CLEANING

Shorter drying time—thorough and rapid intermixing, assuring uniform temperatures in batch—completely dustless operation—no crystal breakage—no caking or contamination! Every superior feature you need, you get in Patterson's CONAFORM. Write.

Richard L. Cameron
President



PLUS VACUUM-TIGHT DUSTLESS DISCHARGE VALVE

Vacuum-tight discharge valve is dustless, full opening, easy to operate. Unobstructed flow, no grooves to trap materials—sleeve attachment permitted.

The Patterson Foundry and Machine Company
East Liverpool, Ohio, U. S. A.
NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI, ATLANTA, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE
The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada
MONTREAL

When inquiring check CP 7140 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Gives information about acetone

Twelve-page data folder gives physical and physiological properties of acetone. Specs, constant-boiling mixtures, solvent properties, and resin solubilities are given. Six charts are included.

Bul F-8650 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 7141 on handy form opposite last page.

Describes leasing and financing of industrial trucks

Booklet issued by manufacturer of material handling equipment describes six-way procurement plan. This plan makes it possible to obtain industrial trucks by broad lease program, time payment plan, short-term rental plan, outright purchase, truck trial plan, and trade-in program. Brochure describes each method in detail.

"Six-Way Procurement Plan" is issued by Lewis-Shepard Products, Inc., Dept. CP, 194 Walnut St., Watertown, Mass. When inquiring specify CP 7142 on handy form opposite last page.

Features cross-sectional views of heat exchangers, coolers

Heat exchangers for process industries are described in illustrated 12-page booklet. Units range in size from six-inch diameters to 13-foot shells with 8000 tubes. Included are exchangers, coolers, condensers, waste heat boilers, tubular reactors, reflux sections, catalyst coolers, and high pressure gas coolers. Cross-sectional diagrams of all units are shown.

"Heat Exchangers" is issued by The M. W. Kellogg Company, Dept. CP, 225 Broadway, New York 7, New York. When inquiring specify CP 7143 on handy form opposite last page.

Formulations, processing methods of epoxy laminate binders

Starting information on formulation of binders for laminates from combinations of liquid polymers with several liquid epoxy resins by wet layup methods is presented in eight-page bulletin. Physical properties of finished glass fiber laminates are given.

"Thiokol Liquid Polymer/Epoxy Resin Laminates" is issued by Thiokol Chemical Corp., Dept. CP, 780 N. Clinton Ave., Trenton 7, N. J. Specify CP 7144 on handy form opposite last page.

Describes compact transmitter for low pressure service

Technical bulletin describes pneumatic transmitter for measuring flow, level and differential pressures in water filtration and sewage plants and for low-pressure industrial service. Bulletin contains photographs, installation diagrams, operational details of the compact transmitter.

Bul SUP. 285-L2 is available from Builders-Providence, Inc., Dept. CP, 345 Harris Ave., Providence, R.I. Specify CP 7145 opposite last page.

Advantages of rubber linings for tanks, valves, pipes

Advantages and application of rubber lining to steel tanks, drums, pipes, valves, fittings, and pumps, are described and illustrated in eight-page bulletin. Included are tables giving resistance characteristics of rubber lining to inorganic acids, salts, alkalis, organic materials, and a wide group of miscellaneous materials. Details on chemical, abrasive, and temperature resistant qualities of rubber linings are also given.

Rubber Linings bulletin is available from Protective Coatings Division, Metalweld, Inc., Dept. CP, Scotts Lane & Abbottsford Ave., Philadelphia 29, Pa. When inquiring specify CP 7146 on handy form opposite last page.

Catalogs lighting equipment

One of ten catalog sections on lighting equipment included in brochure is devoted to an industrial unit which projects 35% of light upward, 65% downward. Unit described has removable side panels for ready maintenance. Catalog gives co-efficients of utilization and easy computation of illumination levels in an industrial environment.

Brochure 55 on lighting equipment for many applications is available on letterhead request to The F. W. Wakefield Brass Company, Dept. CP, Vermilion, Ohio.

Time-saving selection tables included in fan catalog

Selection tables, from which the correct fan for the required capacity can be quickly determined, are provided in 28-page bulletin on industrial fans. Complete descriptive information, detailed capacity tables, and dimensional data are also included.

Bul EX-531 is available from Bayley Blower Company, Dept. CP, 1817 South 66th Street, Milwaukee 14, Wis. Specify CP 7147 opp. last pg.

Fabrication and working data for stainless tube and pipe

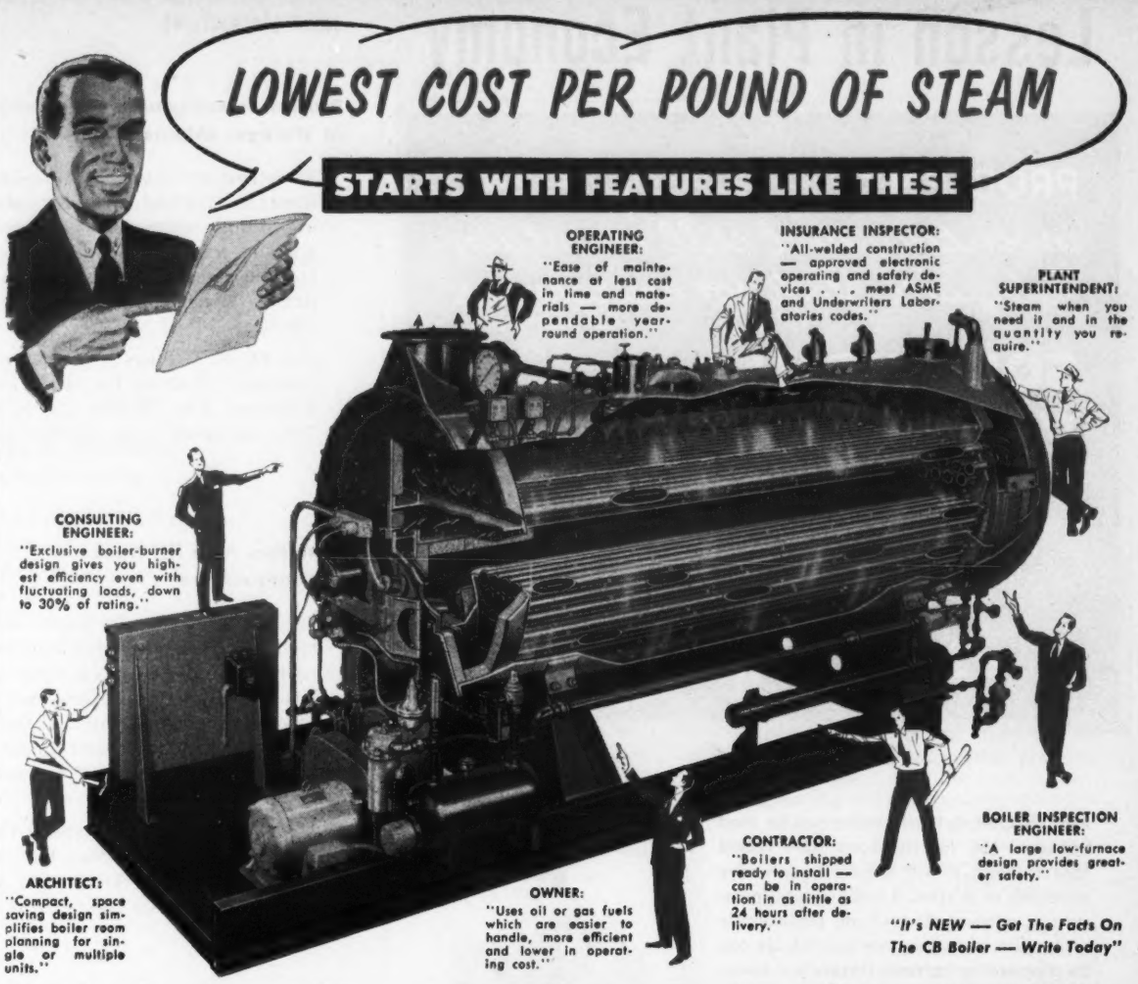
Fabricating and working of stainless tubing and pipe are described and illustrated in 36-page catalog. Helpful hints tell how to design for economical fabrication. A basic section gives fabricating characteristics of ferritic, austenitic and certain specialty steels. Tables provide detailed information of cold bending and coiling both tubing and pipe.

Bul T.D. 114 is available from Alloy Tube Div., The Carpenter Steel Co., Dept. CP, 110 Springfield Rd., Union, New Jersey. Specify CP 7148 on handy form opposite last page.

Describes repair of floors worn by acid attack

Material designed for durable patches or complete overlays where acid, greases and oil conditions have pitted and destroyed concrete surfaces is described in pocket-size folder.

Folder on Stonpach is available from Stonhard Co., Dept. CP, 1306 Spring Garden St., Philadelphia 23, Pa. Specify CP 7149 opposite last page.


LOWEST COST PER POUND OF STEAM
STARTS WITH FEATURES LIKE THESE
OPERATING ENGINEER: "Ease of maintenance at less cost in time and materials — more dependable year-round operation."
INSURANCE INSPECTOR: "All-welded construction — approved electronic operating and safety devices . . . meet ASME and Underwriters Laboratories codes."
PLANT SUPERINTENDENT: "Steam when you need it and in the quantity you require."
CONSULTING ENGINEER: "Exclusive boiler-burner design gives you highest efficiency even with fluctuating loads, down to 30% of rating."
ARCHITECT: "Compact, space saving design simplifies boiler room planning for single or multiple units."
OWNER: "Uses oil or gas fuels which are easier to handle, more efficient and lower in operating cost."
CONTRACTOR: "Boilers shipped ready to install — can be in operation in as little as 24 hours after delivery."
BOILER INSPECTION ENGINEER: "A large low-furnace design provides greater safety."
"It's NEW — Get The Facts On The CB Boiler — Write Today"

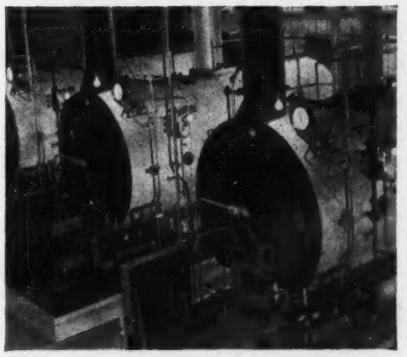
that's why you profit most from Cleaver-Brooks self-contained boilers

• Top to bottom, inside and out, you get more money-saving features when you specify or buy Cleaver-Brooks self-contained boilers. You make an *investment in quality* that pays off in lowest net cost per pound of steam for processing or heating.

YOU BENEFIT from more than 20 years of experience, working closely with men who have made it their business to be *right* about boilers. You profit from complete coordination throughout planning, installing, supervising and final operation.

YOU BENEFIT from self-contained design and original four-pass construction. These Cleaver-Brooks engineered "firsts," plus forced draft, 5 sq. ft. of heating surface per boiler hp, and exclusive burners, all contribute to highest heat transfer. Guaranteed 80% thermal efficiency when firing with oil is the direct result!

Whether you're planning a new steam plant or modernizing, make certain you get the complete Cleaver-Brooks story before you buy. See your Cleaver-Brooks representative, or write for catalog AD-137. Cleaver-Brooks Company, Dept. F, 349 East Keefe Avenue, Milwaukee 12, Wisconsin, U.S.A. *Cable Address CLEBRO — Milwaukee — All Codes.*



One typical owner can count on yearly savings ($15,000 fuel and $10,000 labor) from this battery of three 150 hp Cleaver-Brooks self-contained boilers.

•

NOW — FIRST SIZES OF THE CB BOILER ARE MADE IN CANADA, TOO.

•

Cleaver Brooks

ORIGINATORS OF THE SELF-CONTAINED BOILER

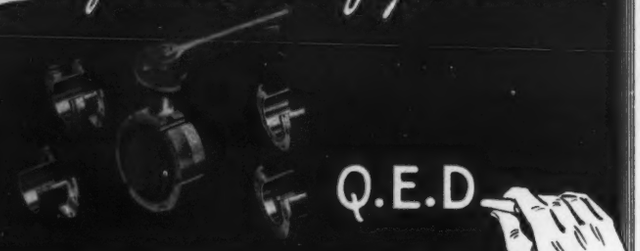
BOILERS . . . STEAM OR HOT WATER . . . FOR HEATING OR PROCESSING, IN SIZES FROM 15 TO 500 hp, 15 to 250 PSI.

When inquiring check CP 7150 opposite last page

Lesson in Plant Economy

PROBLEM: *To reduce valve inventory and still maintain adequate stock for emergencies*

SOLUTION:
Use Keystone Butterfly Valves

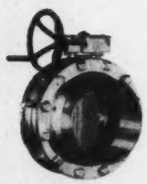


A KEYSTONE Butterfly Valve can be used between 150 lb. standard ASA raised face flanges. It will handle liquids, dry materials or slurries. It seals against pressure or vacuum. Its resilient, replaceable seat resists abrasives. Various metals can be supplied for corrosion resistance. Lever, gear, electric,. pneumatic or hydraulic operators are readily interchangeable.

A KEYSTONE Butterfly Valve serves many purposes. Bulletin No. A-5 contains full information. Write for it today.

KEYSTONE Standard Butterfly Valve with lever handle.

KEYSTONE Connecting Flanges, supplied with threaded, flanged, welding or Dresser-coupling ends, or any combination.



KEYSTONE Gear-operated Butterfly Valve.

KEYSTONE Butterfly Valve with hydraulic operator.

Standard ASA 150 lb. Flanges, furnished in any combination of end connections.

KEYSTONE TOOL CORP.
Trade Mark Reg

KEYSTONE TOOL CORP.
P. O. Box 6716 Telephone KE-1623 Houston, Texas
Representatives in principal cities throughout the world.

When inquiring check CP 7151 opposite last page

NEW LITERATURE

Protect threads, tube ends in storage, shipment

Polyethylene closures, threaded and non-threaded caps and plugs for safeguarding tubing, fittings, valves, and other products in storage and transit are described and pictured in fact file. Uses of the closures are discussed and sizes available for various applications are tabulated.

Fact file on CaPlugs is issued by CaPlugs Div., Protective Closures Co., Inc., Dept. CP, 2207 Elmwood Ave., Buffalo 23, N.Y. Specify CP 7152 on handy form opposite last page.

Describes high lift truck for outdoor use

Bulletin of four pages shows two ton outdoor high lift truck in several applications. Specifications, capacities, speeds, and other data are included. Bulletin also describes how standard fork parts used extensively throughout truck make replacement of parts simple, better. Standard lift of truck is 108" but others are made to order.

Model Y-40 Two-ton High-lift Catalog is available from The Truck-Man Div., Knickerbocker Co., Dept. CP, 699 Liberty St., Jackson, Mich. Specify CP 7153 on handy form opp. last page.

Mixers fit right into pipeline — eliminate tanks, save space

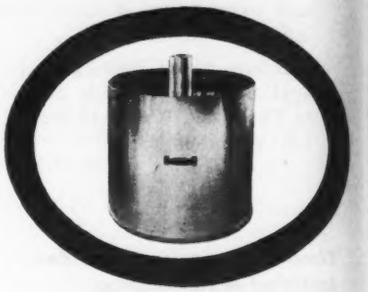
Mixer which fits right into pipeline—eliminating mixing tanks and chambers—is described in four-page illustrated folder. Units are now available in wider range of sizes and capacities and can be installed in vertical, horizontal, or inclined position. Photographs show units and typical installations.

Bul 300 is issued by American Well Works, Dept. CP, 100 N. Broadway Aurora, Illinois. Specify CP 7154 on handy form opposite last page.

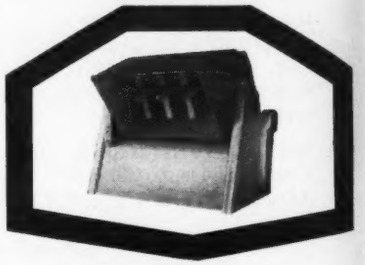
Details glassblowing

Illustrated two-color, four-page bulletin shows many of the steps in producing complicated glass implements and equipment. Facilities and glassblowing service are described. "Technical Glass Blowing" is issued by Glass Instruments Inc., Dept. CP, 301 Pasadena Ave., S. Pasadena, Calif. Specify CP 7155 opposite last page.

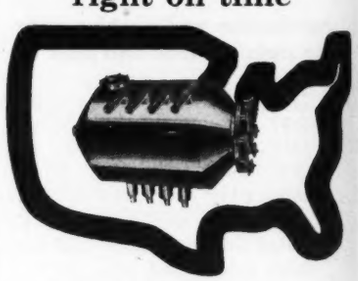
LITTLEFORD
STAINLESS STEEL AND ALUMINUM FABRICATED PRODUCTS FOR THE
CHEMICAL INDUSTRY



made right



right on time

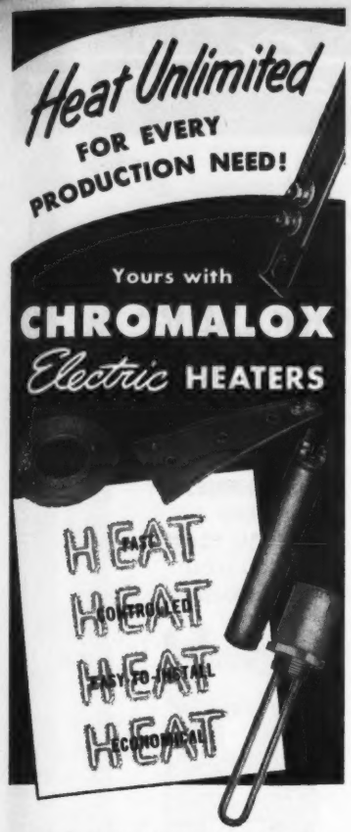


shipped anywhere

Littleford fabricates tanks, bins, vats, troughs, carts and special units . . . from stainless steel, aluminum, nickel, Monel or other non-corrosive metals. Matches your design with precision accuracy. For prompt service at low cost, rely on Littleford, fabricators of plate and sheet metal products for industry since 1882. Send us your blueprints for prompt estimates.

LITTLEFORD
LITTLEFORD BROS., INC.
417 E. Pearl St., Cincinnati 2, Ohio

When inquiring check CP 7156 opposite last page



Need heat for production or processing? Chromalox Electric Heaters are your quick and economical answer. Over 15,000 types, sizes and ratings to choose from to give working temperatures up to 1100°F. Temperatures controlled precisely by either manual or automatic thermostatic controls. No steam-lines, no boilers or expensive equipment to install!

WRITE FOR

Handbook "101 Ways to Apply Electric Heat." It suggests many uses for Chromalox Electric Heater.

EDWIN L. WIEGAND CO., Industrial Division
7517 THOMAS BLVD., PITTSBURGH 8, PA.
Send me the illustrated booklet "101 Ways To Apply Electric Heat." A-4422
Name_____
Company_____
Street_____
City_____ Zone____
State_____
I use heat for_____

CHROMALOX
THE BEST IN ELECTRIC HEAT

When inquiring check CP 7157 opposite last page

Tells what's new in field of radiation instruments

Illustrated 28-page catalog describes scintillation counters, scalers, and other circuits as well as a variety of radioactivity counting accessories.

Catalog B is available from the NRD Instrument Co., Dept. CP, 6429 Etzel Ave., St. Louis 14, Missouri. When inquiring specify 7158 on handy form opposite last page.

Discusses packaging function in large chemical company

A six-part discussion of the packaging function in a large chemical company and the experience of three other companies in packaging products which presented problems of more than average difficulty are presented in 48-page booklet. Some of the subjects discussed with relation to the packaging function at a large chemical company include: an introductory, over-all view; teamwork in package development; packaging from the purchasing standpoint; container efficiency and the production department; packaging for transportation; and packaging as an aid to sales.

Packaging Management Series No. 45 is available by remitting $1.25 ($1.00 to AMA members) direct to the American Management Association, Dept. CP, 330 W. 42nd Street, New York 36, New York.

For corrosion-resistant service — nickel castings

Bulletin of 16 pages describes and illustrates company's facilities for production of corrosion-resistant nickel castings.

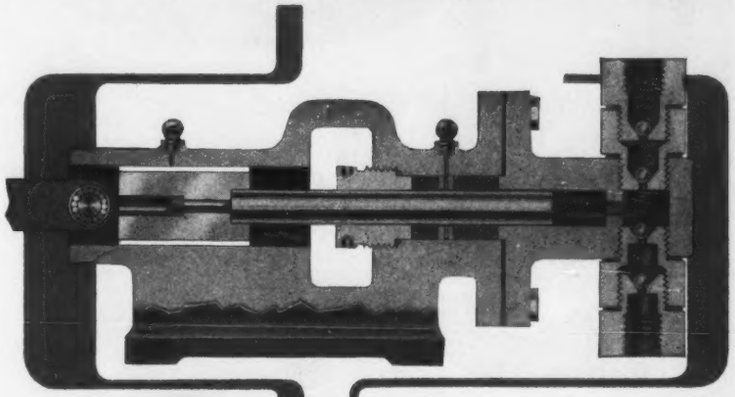
"Cast to Outlast Destructive Service" is issued by The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. Specify CP 7159 on handy form opposite last page.

Catalogs 200-lb bronze valves

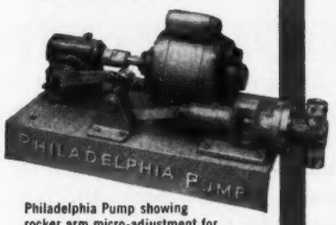
Both screw and flange bronze valves are cataloged in four-page bulletin. Globe, angle, horizontal, and angle check valves are described. General dimensions of the valves in standard sizes from ⅛ to 3 inches are given in tabular form. Construction features are pointed out.

"OIC 500 Line" is issued by The Ohio Injector Co., Dept. CP, 103 Main St., Wadsworth, Ohio. Specify CP 7160 on handy form opp. last page.

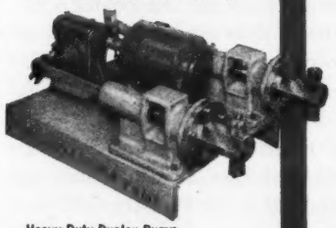
Engineers who know pumps best ... select Philadelphia Pumps



Simplex Pump, Model S-501 for controlled capacities from 5 cc per minute to 5 gph. Pressures to 1500 psi.



Philadelphia Pump showing rocker arm micro-adjustment for varying pump capacity in operation.



Heavy Duty Duplex Pump, Model S-3032 for controlled capacities to 750 gph. and pressures to 10,000 psi.

Philadelphia controlled capacity chemical pumps are designed for pump men—to meet the practical requirements of low initial cost, operating and maintenance economy.

Design features dependable, common sense, low cost arrangements that offer better service with less grief than any other chemical pump on the market.

For instance all Philadelphia Pumps are constructed to allow removal of all moving parts through the oversized crosshead without breaking piping connections—a great advantage in maintenance.

Packing gland is easily accessible at *both* ends.

Valves of liquid ends are machined of solid stainless steel bar, thus eliminating pressed seats which can work loose in operation.

All Philadelphia Pumps feature strong, rugged construction.

Automatic capacity control mechanisms include conventional rocker arm with Micro-adjustment, Uni-Feeder and patented "Philatrol."

For complete description of Philadelphia Pumps and Pump Selection Chart, write for new Bulletin S-1254.

PHILADELPHIA PUMP & Machinery Co., Inc., 1513 Race St., Phila. 2, Pa.

PHILADELPHIA PUMP
AND MACHINERY COMPANY, INC.
SUBSIDIARY OF AMERICAN METER COMPANY / EST. 1836

When inquiring check CP 7161 opposite last page

WATSON-STILLMAN

Takes the EFFORT out of PIPING INSTALLATION

Here's a pipe connection that really simplifies piping fabrication and installation. It's easy to assemble... and just as easy to take apart, yet it provides a strong, tight joint. Ideal for those hard-to-reach locations. The clamp can be rotated so the nuts are in the most convenient position for gripping and turning with a wrench. And only one wrench is needed for tightening because the heads of the carriage bolts are self-locking.

W-S Clamp-Ring Unions are available for butt-welding, socket-welding and screw-end pipe. Try them in your piping system. See for yourself how convenient... and effective... they are.

For more information on Watson-Stillman Clamp-Ring Unions and for available sizes and specifications, send today for Bulletin CRU-1.

Sold Through Leading Distributors

WATSON-STILLMAN FITTINGS DIVISION

H. K. PORTER COMPANY, INC.
Roselle, New Jersey

12

When inquiring check CP 7162 opposite last page

NEW LITERATURE

Guide to maintenance cleaning

Quick-reference charts of cleaning materials, methods, solution concentrations and temperatures are contained in 12-page cleaning guide. Cleaning equipment is described and various plant cleaning jobs are discussed.

"Plant Maintenance Cleaning Guide" is available from Oakite Products, Inc., Dept. CP, 19 Rector St., New York 6, N.Y. Specify CP 7163 on handy form opposite last page.

Latest information on uses of vinyl butyral resins

Widely known for their use in safety glass, vinyl butyral resins are finding increased use as wash primers or metal conditioners, wood and metal finishes, and adhesives and cloth coatings. Latest data on properties and applications are presented in text, graphical, and tabular form in 28-page booklet.

Tech Release No. 11 is issued by Bakelite Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. Specify CP 7164 on handy form opposite last page.

Covers theoretical, practical aspects of plate and frame filters

Doubling as a handy reference on plate and frame filters, 30-page catalog covers both theoretical and practical aspects of the units. Fully illustrated with photographs, drawings, diagrams, and charts, book discusses various presses, plates, filter media, and accessories.

Cat 55 is issued by T. Shriver and Company, Inc., Dept. CP, 810 Hamilton Street, Harrison, N. J. Specify CP 7165 on handy form opp. last page.

Electronic control systems for boiler feedwater

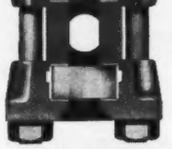
Illustrated by three schematics in two colors, electronic feedwater control systems are described in four-page bulletin. Instrument systems are shown for one to three elements including water level, steam flow, and feedwater flow. Three systems are suggested to meet requirements of small, medium, and large boilers under normal to severe operating conditions.

Pub 54-1073-221 is issued by The Hays Corporation, Dept. CP, Michigan City, Indiana. Check CP 7166 on handy form opposite last page.

Strahman

HIGH PRESSURE GAUGES

USED IN **REFINERIES** *AND* **CHEMICAL PLANTS** *THROUGHOUT THE WORLD*



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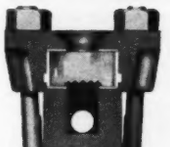

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Single or Multiple Sections

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Gauge Cocks
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Large Chamber Reflex Gauges
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Heated or Cooled Gauges

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STRAHMAN VALVES, Inc.
16 Hudson St., New York 13, U.S.A.

When inquiring check CP 7167 opposite last page

Describes protective coatings for tough applications

Protective coatings are subject of four-page data bulletin. Applying different materials as a coatings "system" provides extraordinary resistive properties. Service conditions dictate which system to use for a particular application. This bulletin contains a concise list of common industrial corrosives and the best system to use against each.

"Ucilon Protective Coatings" is issued by United Chromium, Inc., Dept. CP, 100 E. 42nd St., New York 17, N. Y. Check CP 7168 on handy form opposite last page.

National plumbing standards

Uniform code for plumbing has been approved as the country's first true national plumbing standard. Code is designed to modernize existing practices and to coordinate work of equipment manufacturers, contractors, designers, and public officials. 186 pages.

To obtain "American Standard National Plumbing Code" remit $3.50 direct to American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N.Y.

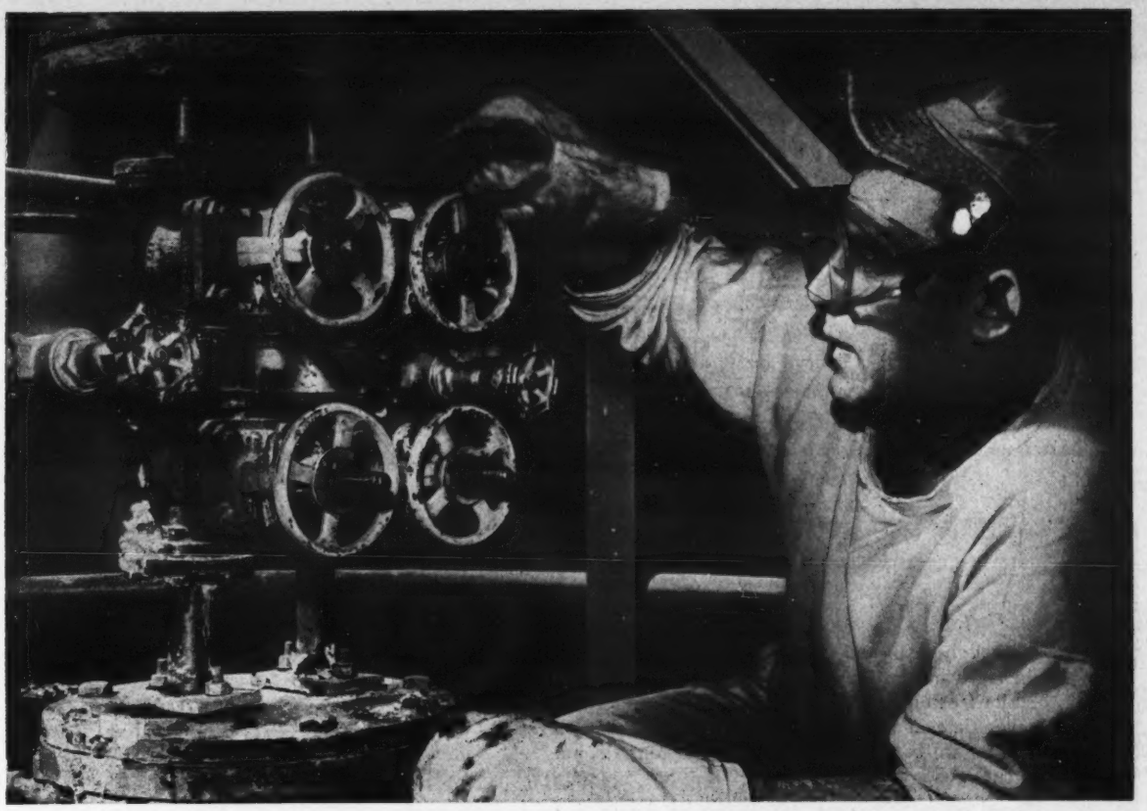
Pocket-size calculator determines duct sizes

Pocket-size calculator determines at a glance proper duct size requirements for various applications. Front of device has two sets of scales: first converts gas flow volume and velocity to duct diameter or converse; second reads friction loss per 100 ft for given duct size and gas velocity. On back are two scales: first converts round duct diameter into equivalent rectangular ducts, second converts diameter in inches to area in square feet.

Calculator is available on letterhead request to The Ducon Company, Dept. CP, 147 East 2nd Street, Mineola, L. I., New York.

Tells how to solve problem of constant temp in lab

Illustrated four-page bulletin shows several ovens and furnaces for laboratory use. These are grouped and described according to their fields of use. Code SP is issued by The Electric Hotpack Co., Inc., Dept. CP, Cottman Ave. at Melrose St., Philadelphia 25, Pa. Specify CP 7170 on handy form opposite last page.



220 Answers. Here at the $15 million caustic soda-chlorine plant of the Hooker Electrochemical Company at Montague, Michigan, 220 Powell Valves made of Inco-Cast Nickel, solve the problem of handling hot caustic solutions. And service conditions are *tough*. Concentrations up to 73% . . . temperatures to 300°F. . . . pressures to 80 P.S.I.

Where service conditions are tough...

let INCO cast your troubles away!

When the Hooker Electrochemical Company was setting up its new $15 million caustic soda-chlorine plant at Montague, Michigan last year, they needed 220 of these valves.

Each of these valves had to be able to withstand hot, concentrated caustic — without permitting any iron pick-up that would contaminate the product.

Previous Experience Provides Answer

Over at their Niagara Falls plant, their project engineer, Mr. M. M. Brandegee, had already found the answer: Inco-Cast Nickel. He says:

"Our caustic soda is sold on low iron specifications. Therefore, it is imperative both on account of iron pick-up and equipment maintenance, that nickel be used wherever hot solutions are to be handled.

"Iron valves, particularly those handling 50%-73% caustic at the boiling points, would normally have a very short life. Nickel valves, normally, have a life of years."

Inco Casts Bodies in Nickel

That's why the bodies of these 220 Powell Valves are made of Inco-cast Nickel.

All Inco castings are cast to outlast destructive service. Whether of Nickel or any of seven other specially developed alloys, they're made by specialists in casting Inco Nickel Alloys. In any practical design or size. And all eight alloys are available as sand or centrifugal castings.

Get this new booklet

16-page case-history booklet, "CAST TO OUTLAST," describes how many destructive service problems are solved by use of Inco sand and centrifugal castings. Includes properties, alloys available, range of forms, specification data, brief notes on joining, machining. A copy is yours for the asking.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK

Inco Castings Sand, Centrifugal, Precision

When inquiring check CP 7171 opposite last page

Correcting Gas Volumes to Standard Conditions

By CHARLES R. NODDINGS and ROBERT M. LAWLESS

Both of Chemical Engineering Laboratory,
The Dow Chemical Company

Edited by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

Although gas law calculations are simple, mistakes in algebraic sign and inversion of ratios can cause serious errors. Use of this nomograph not only saves time in the calculation, but insures that all factors are considered and that inversions do not occur.

Based on standard gas law, it can be shown that to reduce a metered gas flow to standard conditions (designated by subscript 2) from original (subscript 1) conditions, the following calculation is necessary —

$$V_2 = V_1\left[\left[\frac{Z_2RT_2}{P_2}\right]\left[\frac{P_1}{Z_1RT_1}\right]\right] = V_1\left[\left[\frac{P_1}{760}\right]\left[\frac{273}{T_1}\right]\left[\frac{1}{Z_1}\right]\right]$$

where (consistent units)
- P = pressure
- V = volume
- R = Boltzman's constant
- T = absolute temperature
- Z = compressibilty factor

and subscripts —
- bar = barometer
- o = backpressure on system
- vp = vapor pressure of water (or — see nomograph — gas temperature if gas is water-saturated)

Terms inside brackets are a correction factor, F, shown by this nomograph. If a wet test meter is used (or a dry meter on a wet gas) original pressure P_1 is composed of three parts: barometric and back pressures, vapor pressure of water vapor contained. Therefore, this nomograph solves the equation

$$F = \left[\frac{P_{bar} + P_o - P_{vp}}{760}\right]\left[\frac{273}{273 + t}\right]\left[\frac{1}{Z}\right]$$

Typical Example

Following data is gathered for a gas with a compressibility factor of 0.99: barometric pressure of 720 mm, back pressure of 30 mm, water vapor present to a partial pressure of 32 mm (saturated gas at 30°C), temperature of 30°C. What factor will correct volumes measured under these conditions to volumes at standard conditions?

Note that in nomographic solution shown on page 202, barometric pressure of 720 mm is connected with back pressure of 30 mm and straight line extended to reference line. Second straight line connecting this point with water vapor pressure (or temperature for saturated gas) leads to a point on second reference line. Following transition guide lines, point is moved to adjoining reference line.

When straight line has been extended from this point through proper compressibility factor, final reference point is known. Line connecting this point to gas temperature scale crosses F-scale at 0.86. Factor of 0.86, then, is the correction factor by which observed volume must be multiplied to produce actual volume at standard conditions of 0°C and 760 mm Hg.

CUT HERE AND FILE

Our Guarantee... Your Safeguard

The "K" on a pipe fitting is our signature—and behind that "K" we stand four square. A host of distributors also back precision made "K's" right up to the hilt and they emphasize these three vital points.

"K's" are tough—close-grained and symmetrical.
"K's" have uniform walls and high tensile strength.
"K's" are precision-made—faces of flanged fittings accurately milled—bolt holes evenly spaced—threads tapped full and clean.

If you would avoid time losses and grief tell your distributor that you want the fittings that carry the "K"—the fittings that have passed critical inspection. That's the Kuhns line of fittings —a leader for nearly 70 years.

K PIPE FITTINGS
CAST IRON AND MALLEABLE
3,000 Shapes and Sizes
Catalog upon official request.

THE KUHNS BROTHERS COMPANY
1801 McCALL ST.
DAYTON 1, OHIO
Established 1887

Stocks in Dayton
Los Angeles
Oakland, Calif.
Branford, Conn.

When inquiring check CP 7172 opposite last page

Remote weight selection system described in detail

Proportioning system that permits remote dialing of individual ingredient weights is pictured and described in 28-page bulletin.

Besides describing how system works, bulletin details eleven installations in such varied operations as remote proportioning of oil shale, cement formulating, blending of feeds, net weighing with automatic tare compensation, liquid latex blending, fully automatic rubber compounding, differential weighing, glass batching, and maintaining tension on nylon fabric being processed.

Forty-seven photographs and engineering drawings illustrate these installations. In addition, design and operating characteristics of the automatic proportioning system are explained.

Bul 0351 is available from Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. Specify CP 7173 opposite last page.

Pure molybdenum disulfide as a lubricant

Properties, uses of pure MoS_2 as a lubricant are covered in four-page technical paper. General discussion of lubrication by solids and an illustrated description of MoS_2 in EP lubricants is included. Industrial applications are covered in detail.

"Properties and Uses of Pure Molybdenum Disulfide as a Lubricant" is issued by The Alpha Corp., Dept. CP, 65 Harvard Ave., Stamford, Conn. When inquiring specify CP 7174 on handy form opposite last page.

YOUR data . . . why not share it?

There's a story about the man who swapped an unwanted necktie for a book that a friend of his had finished. It was a fair trade . . . both got something.

There's another story about a man who had an idea and swapped ideas with a friend . . . and both then had two ideas.

Perhaps you've found something useful to you in the data presented in CHEMICAL PROCESSING. How about sharing some of your data ideas with other readers?*

write:

Data Editor
Chemical Processing
111 E. Delaware Place
Chicago 11, Illinois

*CHEMICAL PROCESSING pays $10 for data ideas, on acceptance

14 years of Lake Michigan weather STILL NO CORROSION!

Metallized zinc provides complete protection for steel traffic lane curbs

One of the many things to be seen in Chicago, while driving on the outer drive along Lake Michigan, are unique retractable traffic lane curbs or "fins." Developed and installed by the Chicago Park District in 1940, they provide flexible allocation of roadway capacity on this multiple-lane highway.

Before installation fourteen years ago the steel curbing was grit-blasted and metallized with pure zinc .006" thick. According to Mr. A. J. Blaylock, foreman of the Chicago Park District, no further maintenance has been required, in spite of rain, snow, ice and many tons of salt used during the winter months. Mr. Blaylock further points out that "today the fins look as good as when they were metallized 14 years ago, and in my opinion they will last at least another 14 or 20 years without additional maintenance."

Outer drive along Lake Michigan shore showing steel curbing retracted in foreground.

Zinc metallizing section of retractable curbing back in 1940. Note mesh insert to reinforce concrete later poured in top slot of curbing.

Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

In the chemical field, metallized zinc and aluminum, used with special organic aftercoatings, have proved highly resistant to many corrosives—eliminate undesirable product contamination.

These unique metallic coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Now you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting. Write for descriptive Bulletin 93-X—it's free.

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco* System specifications. For further information or copy of descriptive bulletin write, wire or phone Metco Systems, address and phone number below. **Reg. U.S. Pat. Off.*

Metco System Contractors

Akron Sand Blast Co.
Arthur Tickle Engineering Works, Inc.
Clark Metallizing, Inc.
Dix Engineering Co., Inc.
F. W. Gartner Company
Gulf Engineering Company, Inc.
Metal-Cladding Inc.
M W Protective Coatings Div. of Metalweld, Inc.
St. Louis Metallizing Co.
The Southern Galvanizing Company

Metco Systems

10 Bridge Street, Westbury, Long Island, New York

Telephone: Edgewood 4-1308

METCO SYSTEMS
10 Bridge Street,
Westbury, Long Island, N. Y.

Please send me descriptive bulletin on the Metco Systems.

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company _____

address _____

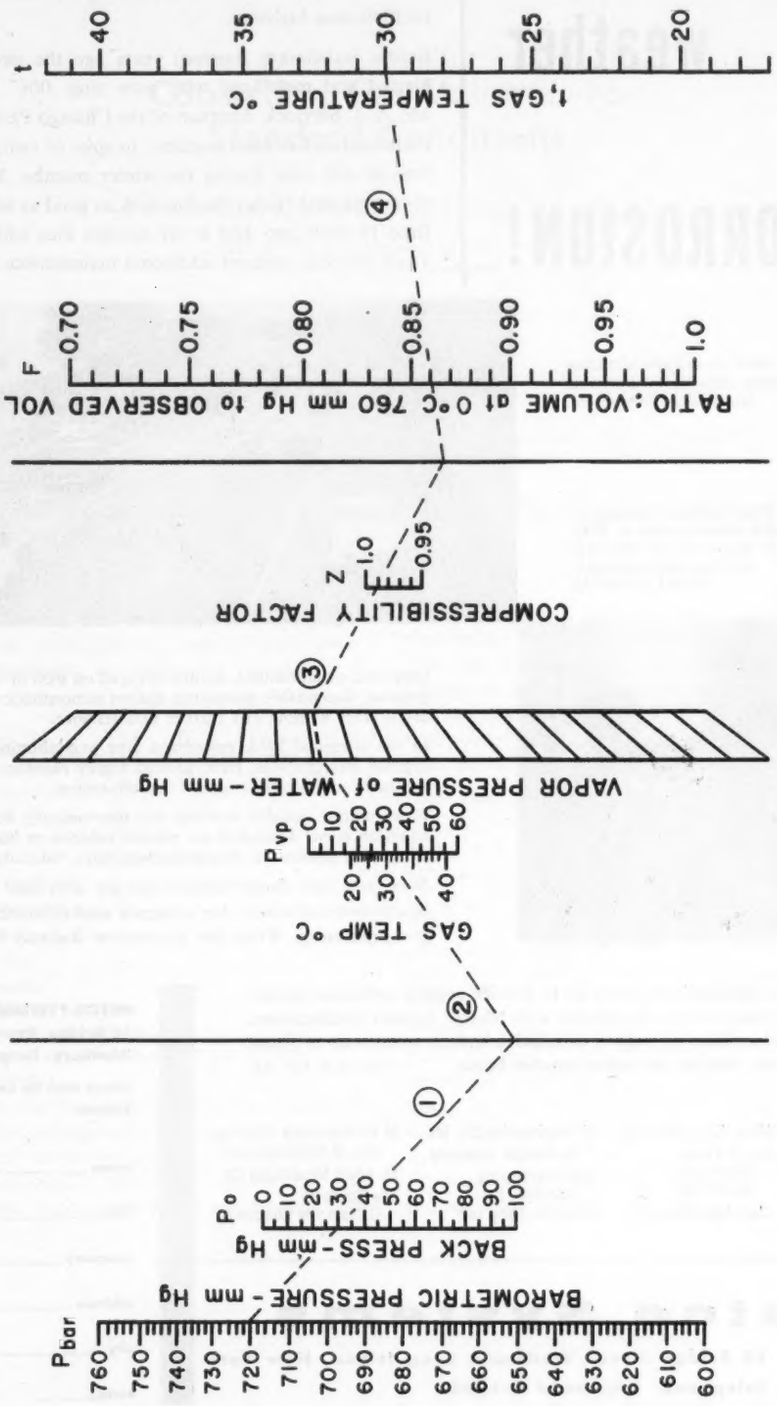
city _____ zone _____

state _____

When inquiring check CP 7175 opposite last page

118b

Correcting Gas Volumes to Standard Conditions



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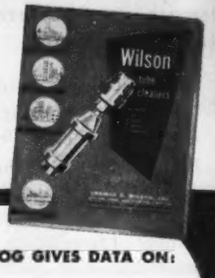
FREE 112-page handbook of TUBE CLEANING equipment



NEW WILSON CATALOG GIVES DATA ON:

- *air-driven cleaners*
- *drill type cleaners*
- *electrically-driven cleaners*
- *water-driven cleaners*
- *cutter heads*
- *air-driven motors*
- *electric motors*
- *steam-driven motors*
- *water-driven motors*
- *and many accessories*

FOR CLEANING THIS EQUIPMENT:

- *boilers*
- *gas coolers*
- *sulfite evaporators*
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- *fuel oil heaters*
- *polymerization units*
- *miscellaneous evaporators*
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- *water heaters*
- *crude column heaters*
- *small transfer lines*
- *miscellaneous heaters*
- *miscellaneous condensers*

FOR THESE INDUSTRIES:

- *air conditioning*
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Representatives in principal cities

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Cable address: "Tubeclean," New York

WILSON TW 654

TUBE CLEANERS • TUBE EXPANDERS

When inquiring check CP 7176 opposite last page

Describes complete line of electric trucks

Manufacturer's complete line of electric trucks is illustrated in 24-page catalog. Rider trucks for six-foot aisle operations are shown together with attachments available for special applications. Also described is 6000-lb capacity portable dock for loading and unloading motor trucks from ground level. Catalog shows the various capacity trucks in actual use.

Electric Truck Catalog is available from The Raymond Corp., Dept. CP, 57-131 Madison St., Greene, N. Y. When inquiring specify CP 7177 on handy form opposite last page.

Standard painting specification, guide to coatings

An easy way to specify paint for coating of structural elements is introduced in tabular form in 30-page bulletin. Description, use, specifications, formulas and application of complete line of paints, enamels and varnishes are also covered.

"Dutch Boy's Standard Guide Specifications 1955" is available from National Lead Co., Dept. CP, Room 1815, 111 Broadway, New York 6, N.Y. Specify CP 7178 on handy form opp. last page.

Vinyl plastisol data

Four-page data sheet on vinyl plastisols outlines typical methods of manufacture for glove coating, spread coating for fabrics, film; dip-coating "strippable" items, dip-coating for heavier thicknesses, metal parts; spray-coating of metal and spray-coating on fabrics and paper.

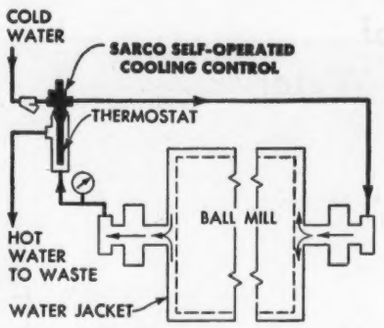
"Plastisols" is issued by Industrial Products Div., The B. F. Goodrich Co., Dept. CP, 448 S. Main St., Akron, Ohio. When inquiring specify CP 7179 on handy form opposite last page.

Illustrates temperature transmitters — operating features in four colors

Describing temperature transmitters which can feed data to receivers up to 1000 ft from the process, eight-page bulletin outlines principles of operation. Standard pneumatic indicators, recorders, or controllers are suggested as receiving instruments.

Bul 3302 is available from the Moore Products Company, Dept. CP, H and Lycoming Streets, Philadelphia 24, Pa. When inquiring check CP 7180 on handy form opposite last page.

How to get more out of process steam



Sarco Cooling Control hook-up on ball mills at Berry Bros. Inc.

Why it Pays to Control Water Jacket Temperature

Sometimes a process calls for cooling rather than heating. Take this typical case history.

Berry Brothers Inc., paint manufacturer in Detroit, uses ball mills to grind pigments. Using manual control, operators were unable to hold jacket water at required temperatures. Since jacket temperature affects grinding time, a costly bottleneck was created in the mill department. Grinding time varied from batch to batch.

Sarco suggested the installation of one of its *self-operated* temperature regulators based on the hook-up shown above.

Results: Cooling water is now maintained at required temperatures. Operations are faster and on a time-table basis. Installation was so successful, Sarco Cooling Controls are now installed on 19 ball mills. Meter tests made by the plant superintendent show monthly savings of $40 to $45 in reduced water consumption.

Sarco self-operated T-44 Cooling Control, automatically holds water at control point by close throttling of discharge flow. Ask for bulletin.

. . . to improve product quality, reduce production costs, eliminate bottlenecks

Make sure the steam traps and temperature controls on your process equipment have been properly specified and installed.

Here's why! Very often when production schedules are upset and steam costs seem relatively high, you'll find the trouble is not with the process equipment . . . *but with the way steam is used!*

Avoid These Production Headaches

The wrong type of trap can cause waterlogging and keep equipment from reaching and maintaining proper temperatures. Result: production slow-downs and waste of steam. Air film caused by inadequate venting drastically reduces heat transfer and prolongs processing time. Erratic temperature control is often the cause of rejects or product spoilage and further raises production costs.

Call In Sarco

Plant after plant has benefited from Sarco's experience in the process industries. Backed by a complete line of steam traps and temperature controls, Sarco engineers are able to offer you impartial, expert recommendations on how to *get more out of process steam.*

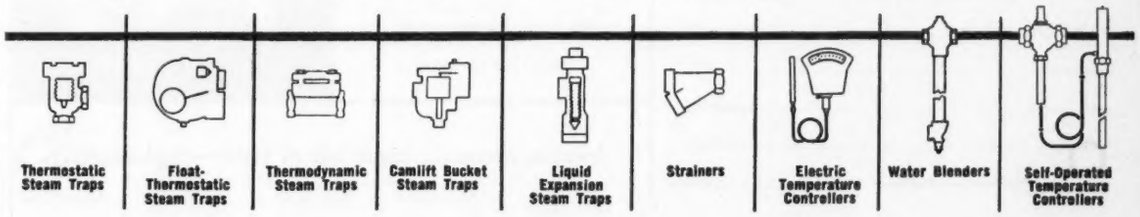
For case histories describing how other plants in your field solved similar problems, write today to Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

SARCO

improves product quality and output

2059B

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



When inquiring check CP 7181 opposite last page

Solubility of Sulfur Dioxide in Water

By D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Recent data[1] on solubility of sulfur dioxide in water can be related by means of the equation

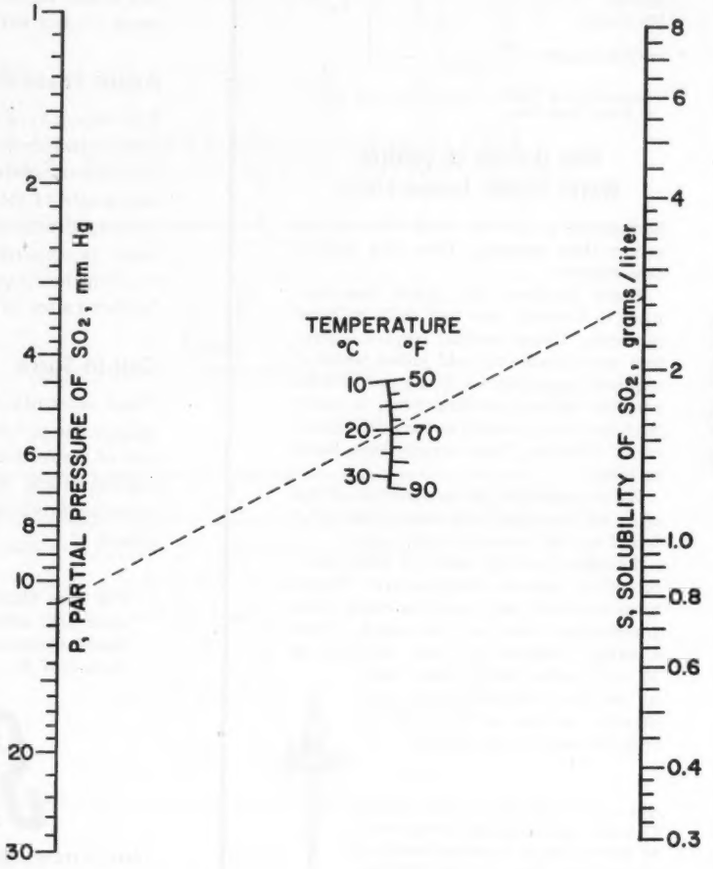
$$S = aP^b$$

where
S = solubility
gm SO_2/l soln
P = partial pressure of SO_2 mm Hg
a and b depend on temperature

Typical Example

What is the partial pressure, at 20°C, of sulfur dioxide over an aqueous solution containing 2.7 grams per liter?

Connect 2.7 on S-scale and 20° on temperature scale. Note that straight line intersects P-scale at 11 mm Hg.



LITERATURE CITED

(1) Research Bulletin, Institute of Paper Chemistry, Vol 20, No. 2, p 67 (1953)

FERRIC CHLORIDE SOLUTION heated without Corrosion

Evaporating water from a ferric chloride solution in an operation to reclaim hydrochloric acid is accomplished economically by a Submerged Combustion installation rated at 60,000,000 BTU per hour. Heat transfer surfaces do not corrode because they are the walls of bubbles in the liquid. In fact, this installation operated steadily for three years before even minor parts replacement was required.

Safety of operation is assured by the exclusive NOZ-L-MIX® principle, which keeps gas and air separate until they reach the point of actual flame.

If you are processing chemicals or treating metal ores it will pay you to find out how you can heat corrosive liquid at top speed and at lower cost with Submerged Combustion equipment.

We'd like to show you proof of these statements and explain how Subcomco® equipment can be applied to your operation. Get in touch with us today.

APPLICATION MANUAL SUGGESTS PRACTICAL COST CUTTING METHODS

Send for Your Free Copy

Submerged Combustion COMPANY OF AMERICA, INC.
765 LOGAN STREET • HAMMOND, INDIANA
A Quarter-century of Service to American Industry

When inquiring check CP 7182 opposite last page

How to apply zinc phosphate before painting steel

Zinc phosphate materials used in company's CrysCoat process to give paint-anchoring coat to steel products are described in 10-page bulletin. Illustrated and explained is the action of this phosphating process in converting steel surface into a complex, heavy phosphate layer chemically bonded to metal. Booklet shows how this coating improves paint adhesion and prevents spread of corrosion under paint.

Bulletin on CrysCoat Process is available from Oakite Products, Inc., Dept. CP, 19 Rector St., New York 6, N.Y. When inquiring specify CP 7183 on handy form opposite last page.

Water conditioning equipment reviewed in 20-page bulletin

Revised 20-page bulletin covers wide aspects of water conditioning. Illustrated with photographs, drawings, and diagrams, literature describes softeners, deionizers, filters, purifiers, zeolites, and other related equipment. Company's laboratory facilities and engineering services are also discussed.

Bul 611B is issued by Elgin Refinite, Division of Elgin Softener Corporation, Dept. CP, 180 North Grove Avenue, Elgin, Illinois. Specify CP 7184 on handy form opposite last page.

Drawings, bills conveyed 20 ft/sec in packaged air-tube system

Prefabricated air-tube system for conveying bills, invoices, drawings, small tools, and other aticles is described in four-page booklet. System handles objects at rate of 20 ft/sec and will connect any two points up to 130 ft apart.

Bul on air-tube system is issued by Lamson Corporation, Dept. CP, 303 Lamson Street, Syracuse 1, New York. When inquiring specify CP 7185 on handy form opposite last page.

Alkyd resin nomograph

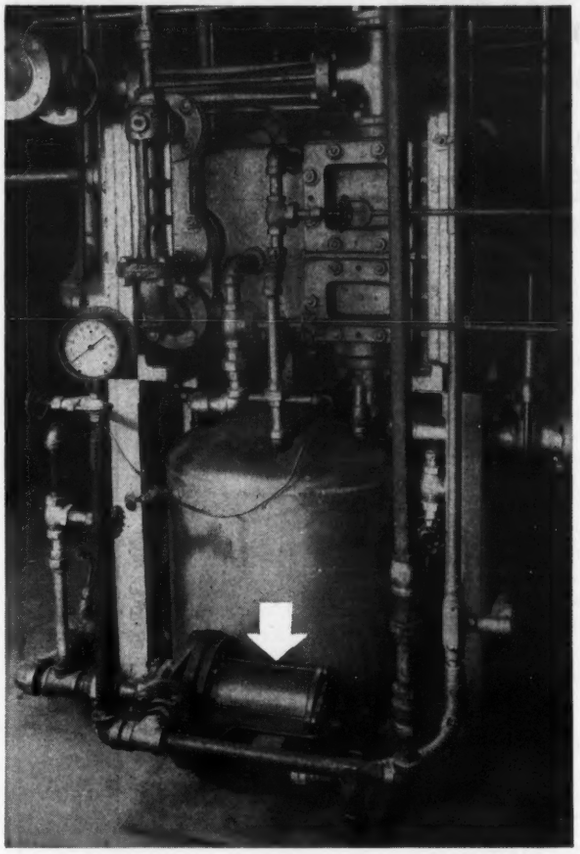
. . . published in April CHEMICAL PROCESSING was presented at the 32nd Annual Meeting of Federation of Paint and Varnish Clubs in Chicago and was originally published in the Official *Digest*. CHEMICAL PROCESSING erred in not crediting this source.

Chempump

prevents costly leakage

at

Bakelite Company



2 hp *Chempump* installed on condenser unit at Bound Brook, N. J., plant of Bakelite Company. This is a vacuum system operating at 28 inches of mercury. Pump discharges at 9 psig. Based on outstanding performance of *Chempump* under extreme vacuum, company is purchasing additional units.

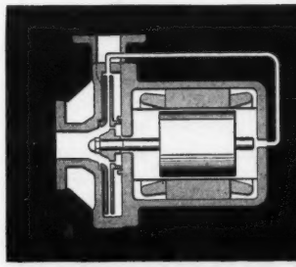
PUMPING condensate from a condenser unit under vacuum posed a critical problem at Bakelite Company. If the pump lost its prime, the condensate would fill up the tank and back up into the system, causing considerable lost time and damage. Any air leakage would destroy the vacuum and render the system inoperative.

Previous pumping equipment required frequent maintenance due to stuffing box leakage. With installation of a seal-less *Chempump,* however, all leakage and vacuum problems were eliminated. Virtually maintenance-free, *Chempump* has shown outstanding performance.

Another tough leakage problem solved by *Chempump.* With this seal-less combined motor-pump unit, normally hard-to-handle fluids can't leak or become contaminated. Periodic inspection to indicate necessity of simple bearing change is the only maintenance required.

Your process can benefit through *Chempump,* too. For details, send for new 16-page Bulletin 1010. Chempump Corp., 1300 E. Mermaid Lane, Phila. 18, Pa.

Engineering representatives in over 30 principal cities in the United States and Canada.



Chempump combines pump and motor in a single hermetic unit. Pumped fluid enters rotor chamber; no shaft sealing device required.

Approved by Underwriters' Laboratories. Available in wide choice of materials . . . from ⅙ to 7½ hp. Capacities to 250 gpm. Heads to 195 feet.

Chempump can't leak!

Chempump —first in the field . . . process proved

Chempump Corp., 1300 E. Mermaid Lane, Phila. 18, Pa.

Please send me details on *Chempump* for:

_____ (application)

*Capacity*_____ *Total dynamic head*_____

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

When inquiring check CP 7187 opposite last page

Densities of Concentrated Solutions of ZINC CHLORIDE

By D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

For concentrated aqueous solutions of zinc chloride (20 to 50 per cent), densities and concentrations are related by the expression

$$\log (d - 0.65) = a + bx$$

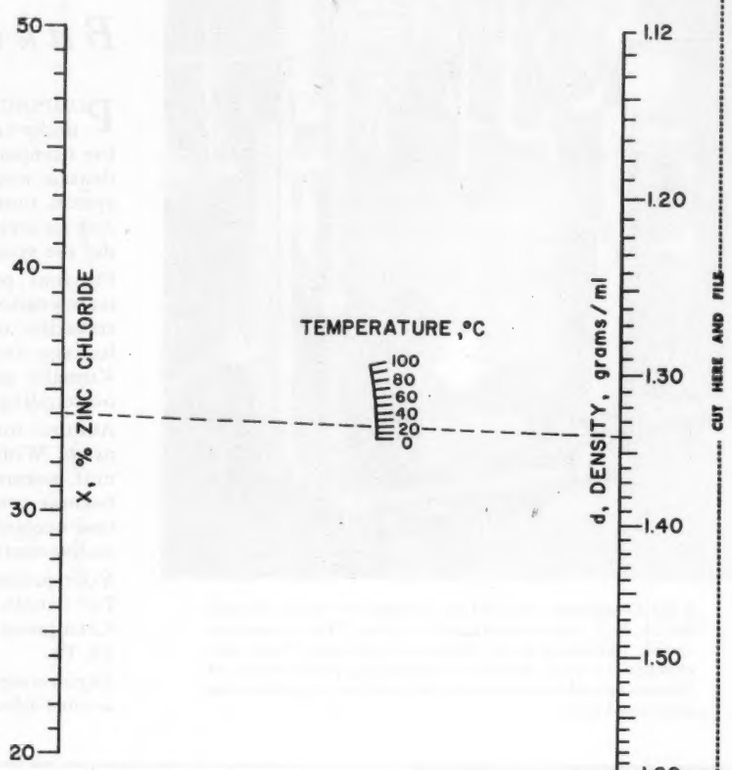
where

d = density of solution gm/ml

x = percentage of zinc chloride %

and a and b depend on temperature.

This nomograph, constructed by methods described previously[1], extends the utility of original data quoted by Perry.[2]



Typical Example

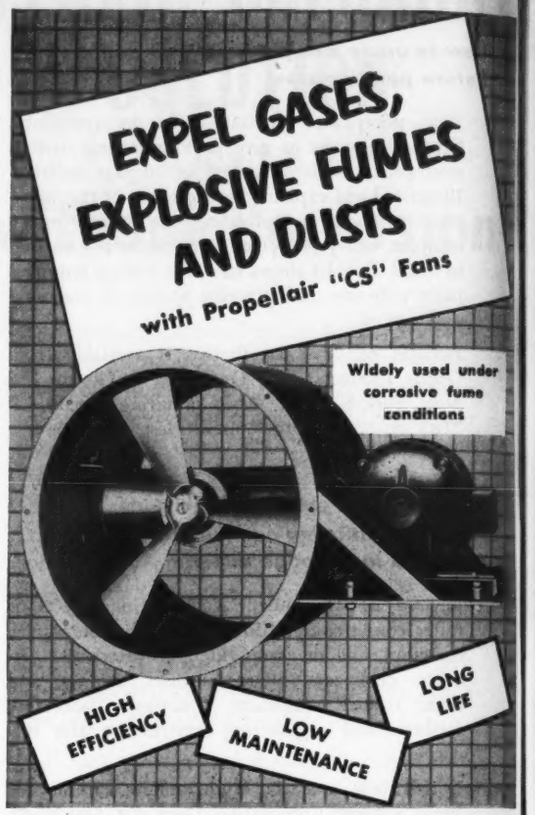
What is the concentration of an aqueous solution of zinc chloride that has a density of 1.340 grams per milliliter at 20°C?

Connect 1.340 on density scale with 20 on temperature scale and read desired concentration as 34.0 per cent.

LITERATURE CITED

(1) DAVIS, D. S., "Empirical Equations and Nomography," Ch IX, McGraw-Hill Book Co., New York, (1943).

(2) PERRY, J. H., "Chemical Engineers' Handbook," 3rd Ed, p 185, McGraw-Hill Book Co., New York (1950).



■ **Propellair** "CS" Fans are rugged, heavy-duty units for duct installation. The cast aluminum alloy airfoil propeller is housed in a welded heavy-gauge steel duct section and belt guard with internal bearing assembly.

Robbins & Myers *All-Weather Motor* located outside airstream. Sizes 20" to 60", with certified air deliveries of 3750 to 85,000 c.f.m. Available with corrosion and abrasion-resisting finishes and with ventilated bearings suitable for operation in high temperatures.

Simplified Installation
Propellair "CS" Fans are built to fit standard duct sizes without the need of elbows. The fan drum has front and rear flanges drilled for easy mounting into duct system.

Our engineers are at your service for fan selection and application advice. Write for Bulletin 650C.

R&M PROPELLAIR
DIVISION OF ROBBINS & MYERS, INC
SPRINGFIELD · OHIO

When inquiring check CP 7188 opposite last page

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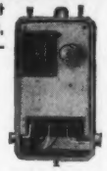
With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers—either open or under high pressure.



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Simple to Install
Require no Servicing

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Bulletin FN—on Non-Conductive Liquids

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TIMING CONTROLS

Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.
For Details ask for
Bulletin LT—Standard Time Switches
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Bulletin R—Time Delay Relays
Bulletin RMC—Auto. Reset Timers
Bulletin ET—Electronic Timers
Electronic or Electric Controls and Timers designed for special service.

DEPENDABLE

Lumenite Electronic Company
407 S. Dearborn St., Chicago 5, Illinois

When inquiring check CP 7189 opposite last page

Are Your Pumps Dependable?

Dependability of your pumps may mean the difference between uninterrupted production and complete shutdown. You cannot afford shutdowns due to mechanical failure in your pumping system. Switch to Ingersoll-Rand MOTORPUMPS for more dependability.

MOTORPUMPS mount in any position and require no special foundation. Select the right units for your job from the most complete line of space-saving centrifugal pumps manufactured. Write for our new Bulletin on this line from ¼ through 75 horsepower . . . capacities to 2800 gallons per minute . . . heads to 650 feet. Prompt shipment from either factory or branch stock.

We can help you with any size pumping problem with units to 4000 horsepower.

Ingersoll-Rand
9-160 **11 Broadway, New York 4, N. Y.**

When inquiring check CP 7190 opposite last page

NEW LITERATURE

Describes toxicology of acrylonitrile

Abstracts of the more important experimental data on toxicology of acrylonitrile, both from published literature and the company's file, are presented in 16-page booklet. Also included is a section on the treatment of persons who have been exposed. Studies summarized in the report show that exposures to the compound are not as hazardous as had been supposed.

"Toxicology of Acrylonitrile" is issued by Petrochemicals Dept., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. Specify CP 7191 opposite last page.

Describes "skunk juice" injection system

Automatic control system used on natural gas pipelines to inject odorants (skunk juice) into varying gas flows is described in two-page folder. Diagram illustrates how a controlled volume pump is used as final control element to accurately inject optimum amounts.

Data sheet E-54-7 is issued by the Milton Roy Company, Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. Specify CP 7192 opposite last page.

Shows specimen colors of calcium lithopones

Folder, 16 x 18 inches, shows patches of specimen colors of formulations of manufacturer's cadmium lithopone pigments. Properties of these pigments are also given.

"Harshaw Cadmium Lithopones" is issued by The Harshaw Chemical Co., Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio. Specify CP 7193 on handy form opposite last page.

Save time, costs, property...with HYDRALT* ASPHALT (Clay-Type) Coatings

..."one coat" protection for all around the plant

Don't let moisture, fumes, smoke and weather attack your property and equipment. Protect your metal and masonry . . . your insulating materials . . . with *one* coat of Flintkote Hydralt.

Yes, even one coat of Hydralt gives thick film, more economical protection against corrosion, rust and the effects of moisture infiltration than 8 or 10 coats of paint. And think of the time savings, too.

Hydralt Protective Coatings are unique (clay-type) asphalt emulsions. Films about 3/64" thickness have provided completely satisfactory resistance to weather in industrial atmosphere for over 24 years.

These Hydralt coatings are reinforced within themselves . . . will not crack, craze, or alligator under exposure. Will not soften or flow under heat. Won't sag or peel off.

They are odorless. Non-flammable to apply by brush, spray or trowel.

Flintkote's line includes the right products for your protective coating needs. For light reflective surfaces . . . Asphalt base Aluminum Paint. For oil or grease resistance...ORTAR† Emulsion Coating.

Want more information about these products? Just write...or look us up in Sweet's.

Over 50 years of specialized experience . . . by phone, mail or personal call. No obligation.

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Protect structural steel with Flintkote Hydralt Coatings.

Masonry structures resist weather better with Hydralt.

Apply Flintkote Aluminum Paint over Hydralt, for light color.

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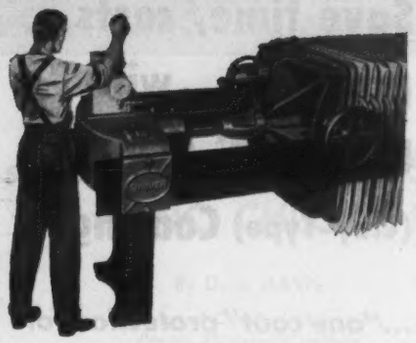
When inquiring check CP 7194 opposite last page

Install HYDRO-KLOSERS

on Your

Filter Presses and SAVE



The Hydro-Kloser is a low cost, compact, rugged hydraulic closing device that eliminates time loss and hard labor inherent in manual closing of filter presses. A few easy strokes of the hand lever on the pump bring the pressure to complete tightness of the filter press. This takes but two to three minutes. Opening the press is just as speedy.

The more uniform, more powerful thrust of the Hydro-Kloser assures better closure; minimizes leakage difficulties; saves time per filtration cycle.

It pays to be safe and to save with Hydro-Klosers. Get the full story. Write for bulletin.

This low cost closing unit, easily installed on existing Shriver and other make filter presses, consists of a simple hydraulic ram operated by a small, sturdy hydraulic pump. The ram assembly is mounted on the inside face of the screw standard, replacing the regular screw bushing. Standby manual closing is always available.

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Filter Presses · Filter Media · Diaphragm Pumps

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When inquiring check CP 7195 opposite last page

Engineered TO HANDLE ABRASIVE SOLUTIONS AT HIGH PRESSURE

John BEAN **Reciprocating Pumps perform better and longer**

Because **of modern design features**
1. **Porcelain-lined or ceramic cylinders.**
2. **Self-expanding piston cups.**
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Because **the sectionalized fluid end provides STRAIGHT-LINE FLOW.**

Because **the all-enclosed drive end is dust-proof, and roto-splash lubricated gear teeth and bearing surfaces are Tocco hardened.**

Because **John Bean pumps provide more pumping power in less space, and working parts are readily accessible for easy maintenance.**

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Please send me your catalog on John Bean High Pressure Reciprocating Pumps

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Capacity: 1 to 60 GPM
Pressure: 100 to 800 P.S.I.

When inquiring check CP 7196 opposite last page

NEW LITERATURE

Offers technical papers on synthetic rubber

Four-volume compilation in paper covers abstracts of technical papers published during 1942-1952 from the Government Synthetic Rubber Program. Included is a summary of synthetic rubber research work performed by university, industrial, institute, and Government groups participating in the synthetic rubber research program. Author and subject indices are included.

"Abstracts of Technical Papers from the Government Synthetic Rubber Program" may be obtained by remitting $5.00 per set directly to Federal Facilities Corporation, Washington 25, D.C.

High-boiling solvent described

Butyl "Carbitol" acetate (diethylene glycol monobutyl ether acetate), a high-boiling solvent used in formulation of nitrocellulose and synthetic resin coatings, flash-dry printing inks, and as an extractant for separation of alcohols and ketones, is subject of four-page technical bulletin.

Bul F-8644 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. Specify CP 7197 opp. last page.

Gives operational features of scale control unit

Bulletin of four pages describes electric unit for boiler scale control. No chemicals are required. Sizes, capacities, and installation details are included.

Bul 200 R is available from Aqua Electric Scale Control, Inc., Dept. CP, 2028 East 22nd St., Cleveland 15, Ohio. Specify CP 7198 opposite last page.

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When inquiring check CP 7201 opposite last page

Bulletin describes direct-drive, gear-drive mixers

Design, specifications, and features of manufacturer's line of portable and permanent-mounting mixers are discussed in eight-page bulletin. Units range in motor size from ¼ to 25 hp and are available with gear drive or direct drive — depending upon model. Bulletin includes photographs, engineering drawings, and data charts.

"Mixmor Mixers" is issued by McNamara Manufacturing Company, Dept. CP, 3135 Casitas Avenue, Los Angeles 39, California. When inquiring specify CP 7202 on handy form opposite last page.

Discusses chemical flocculation of refinery wastes

Chemical flocculation of refinery waste is discussed in 16-page technical reprint. Photographs, diagrams, and tables are included. Article lists as its major subjects 1) General and detailed description, 2) Cost of construction, 3) Manning the plant, 4) Start-up problems, and 5) Operating data.

Manual RP-9340 is issued by Proportioneers, Inc., Division of B-I-F Industries, Inc., Dept. CP, 345 Harris Avenue, Providence, R. I. When inquiring specify CP 7203 on handy form opposite last page.

Fan selection data included in 24-page bulletin

Advantages of belt-driven and direct-drive centrifugal fans, their construction features, and special features for specific applications are detailed in 24-page bulletin. A large section is devoted to fan selection data and includes capacity tables, dimensions, and mechanical specifications.

Bul DS-348U is available on letterhead request from The Trane Co., Dept. CP, 202 Cameron St., La Crosse, Wis.

American standards indexed

About 1500 American standards are listed in 48-page publication. Included are petroleum products, chemical, metallurgy, rubber, and textile standards. Numbers and prices are indicated. A comprehensive index is included.

"Price List and Index of American Standards — 1955" is issued by American Standards Assn., Dept. CP, 70 E. 45th St., New York 17, N.Y.

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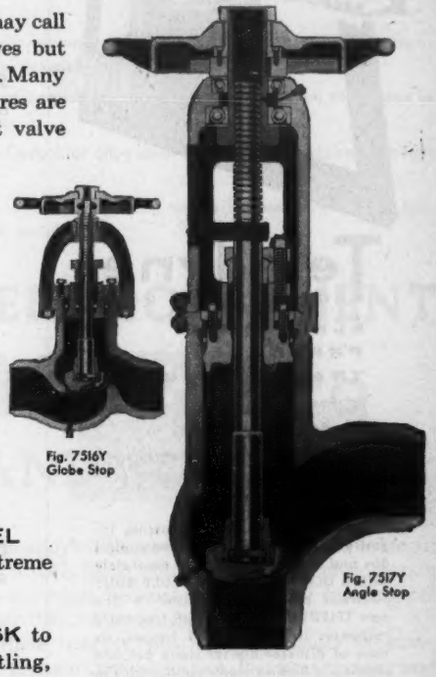
High pressure applications may call for special high pressure valves but not necessarily high-cost valves. Many of the Edward standard features are expensive "specials" for most valve manufacturers. For example, standard Edward high-pressure valves in the larger sizes have these features at regular prices:



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Room temperature ratings for standard Edward valves range up to 6000 psi or at higher temperatures ratings go to 2500 psi at 1035°F. For corrosion resistance or for extremely elevated temperatures, appropriate materials can be supplied.

Always specify Edward. Only Edward Valves Equal Edward Quality and Performance.

For more details on large size, high pressure Edward Pressure-Seal valves as well as other Rockwell Built EDWARD forged and cast steel valves, write for the Edward Condensed Catalog.

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When inquiring check CP 7204 opposite last page

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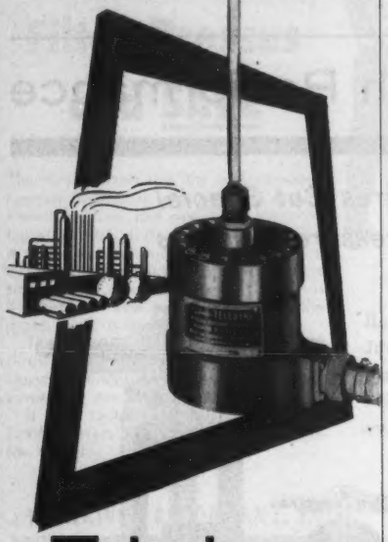

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At last, the chemical processing industry can measure, record and control gas and fluid pressures more accurately with a DEPENDABLE, RUGGEDLY BUILT electrical pressure transmitter • The new TELEDYNE, with its high frequency response, its 15 different ranges, its ease of disassembly for clean out and repairs, is finding many applications in research, testing and processing • Stainless steel pressure chamber permits handling of corrosive gases or fluids, including fuming nitric acid • With explosion hazard present, greater safety is provided by telemetering information to protected location • BONDED strain gage makes Teledyne practically unbreakable and insensitive to vibration.
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When inquiring check CP 7205 opposite last page

NEW LITERATURE

Lists points to consider about blow-off valves

Points to consider when choosing a blow-off valve for boiler equipment are listed in four-page bulletin. Author points out hazards involved with blow-off valves and defines uses and specifications for proper choice. Applicable section of ASME Boiler and Pressure Code is included.

"Can You Select a Blow-off Valve?" is issued by Yarnall-Waring Co., Dept. CP, Chestnut Hill, Philadelphia 18, Pa. Specify CP 7206 on handy form opposite last page.

Shows subminiature switches in two colors

Line of subminiature snap-action precision switches, auxiliary actuators, toggle and pushbutton switch assemblies is described in 12-page catalog. Information given includes electrical rating, uses, dimensions, force and travel specs, mounting requirements. Auxiliary actuators are shown to adapt subminiature switches for cam and slide actuation.

Cat 75 is available from Micro-Switch, Division of Minneapolis-Honeywell Company, Dept. CP, Freeport, Illinois. When inquiring specify CP 7207 on handy form opposite last page.

Chiller for industrial cooling subject of bulletin

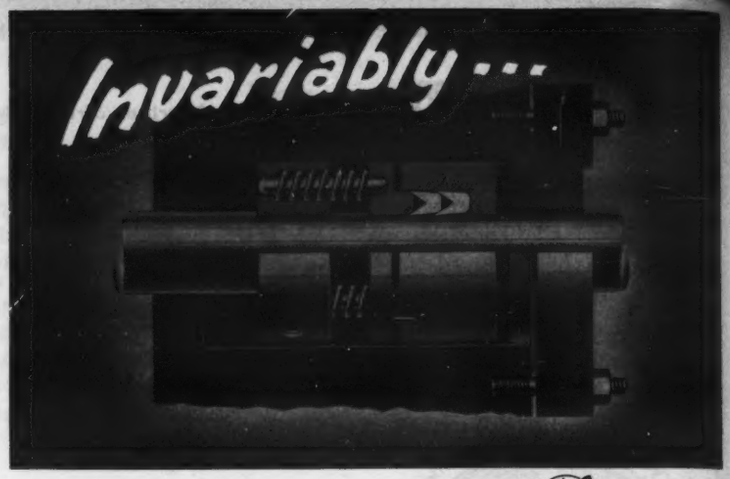
Flexibility of Flow-Therm packaged liquid chillers of 15 to 220 ton capacities is emphasized in eight-page two-color catalog.

Catalog 220-A is issued by Acme Industries, Inc., Dept. CP, 600 N. Mechanic St., Jackson, Mich. Specify CP 7208 opposite last page.

High-speed winding control explained in bulletin

Describing sensing unit for edge alignment, four-page bulletin outlines advantages of differential-pressure web edge sensing system for high-speed sheet winding. As bulletin explains, controlled air flow senses momentary misalignments or average trends. Applications in dusty areas and inaccessible locations are suggested.

Bul 285 is available from H. G. Weber and Company, Inc., Dept. CP, Kiel, Wisconsin. Check CP 7209 on handy form opposite last page.



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for long dependable service
WHERE ....ECONOMICAL OPERATION IS DESIRED
....OPERATING CONDITIONS ARE HAZARDOUS
....LOSS OF COSTLY FLUIDS MUST BE PREVENTED
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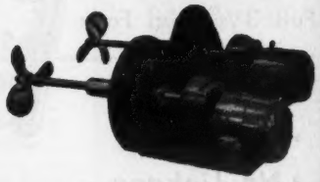
When inquiring check CP 7210 opposite last page

if MIXING is the problem ...



ALSOP has the answer

For over 30 years, processing men have relied on the consistent high standard of Alsop Mixers — and the technical service of Alsop engineers to help solve their mixing problems.

If your process involves mixing, blending, suspending or dissolving, it will pay you to invest in an Alsop Mixer. Available in portable or stationary models in a wide range of powers, speeds and propeller combinations for efficient, economical operation.

Write for complete information giving details of liquids and quantities to be handled.

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It pays to buy - ALSOP
FILTERS - MIXERS - PUMPS & TANKS

When inquiring check CP 7211 opposite last page

Weighs dry raw materials, granules or large lumps

Technical reference sheet describes a shrouded, large-draft (25 cu ft), automatic weigher which handles all materials from granular to large lumps as well as hot materials. Features of the unit are detailed. Photos supplement text.

Technical Reference No. 54E is available from Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. When inquiring specify CP 7212 on handy form opposite last page.

Aids in selecting glycerine alkyds to meet specific coating needs

Detailed outline of various glycerine alkyd resins, their properties and selection are presented in 20-page digest-size booklet. Methods of manufacture, material costs, and how changes in formulation affect them are also discussed. Present and probable future trends in manufacture and use are presented. Charles R. Bragdon, consultant, is author.

"Glycerine Alkyds Tailored to Need" is issued by Glycerine Producers' Assn., Dept. CP, 295 Madison Ave., New York 17, N.Y. When inquiring specify CP 7213 on handy form opposite last page.

Models for production lines

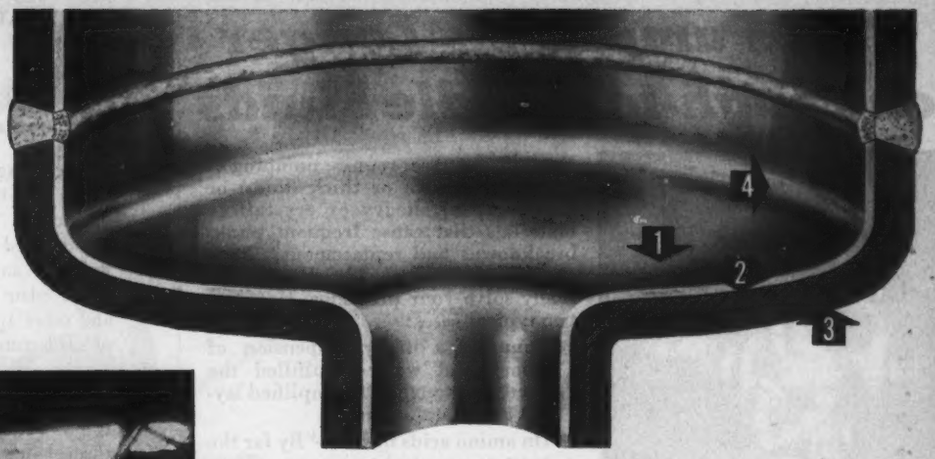
Questions and answers on layout models are given in four-page illustrated folder. These models contain only essential detail and cost about half that of heavily detailed models.

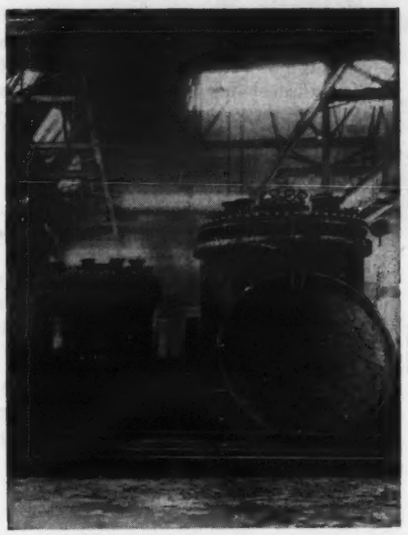
"Models for Production Lines" is issued by Industrial Models, Inc., Dept. CP, 2311 Sconset Rd., Wilmington 3, Del. When inquiring specify CP 7214 on handy form opposite last page.

Numerous industrial applications of P-S tapes pictured

Numerous applications for company's pressure-sensitive tapes in the drug, medicine, cosmetic, and other industries are pictured in six-page folder. Six kinds of tape are described and their various uses illustrated. Printed tapes are discussed as are dispensers for various tapes.

Form P-DSCF2(44.5)J is available from Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. Specify CP 7215 on handy form opposite last page.





These chemical reaction tanks were fabricated from wide plates of Nickel-Clad Steel.

1. **ECONOMY**—High-alloy layer—usually 10% or 20% of total plate thickness—assures corrosion and abrasion resistance, long equipment life.
2. **DESIGN FREEDOM**—Integral bond allows design and fabrication of shapes to meet process and space needs.
3. **STRUCTURAL STABILITY**—Carbon or alloy steel backing gives required strength and rigidity at lower cost.
4. **LESS MAINTENANCE**—Smooth, hard surfaces, rounded corners and sloping bottoms mean easy cleaning and draining.

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Where cleaning and maintenance problems hamper continuous operation, slow down process change-overs or run production costs up, corrosion-resistant clad steel equipment can provide the *economical* solution. Clad's smooth, high-alloy surfaces are virtually maintenance-free, often need only to be flushed with water. Where drastic cleaning methods must be used, the clad surfaces won't chip or peel. Because of the permanent bond between cladding and backing, tanks and vessels may be designed with the rounded corners and sloping bottoms that assure quick, easy drainage.

There are sixteen Lukens' Clad Steels—various types of stainless, nickel, Inconel, Monel, copper. They give you corrosion and abrasion resistance, protect product purity to the same degree as solid high alloys with savings of up to 50% in material costs. The ASME Code permits full gage consideration for design purposes because cladding and backing are bonded over their entire surface.

To get these benefits, plus long life under pressure, vacuum or thermal cyclical service, fast heat transfer and easy modification when processes change, ask *qualified* builders about clad steel equipment. These men are experts, understand your problems, and will work with your engineers and consultants. We offer the widest selection of clad steels available anywhere and we can help in the selection of the type of clad steel that best suits your needs. If you would like more information, consult one of your equipment builders, or write Manager, Marketing Service, Lukens Steel Co., 750 Lukens Building, Coatesville, Pa.

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NEW LITERATURE

Physical and chemical properties of clad steels described

Full coverage is given the manufacture of clad steels and the physical and chemical properties of each in 72-page illustrated manual. Included are detailed sections on flame cutting, forming, welding, and finishing. Tabulated data include types, plate sizes, weights, shearing tolerances, and other specifications for company's entire line of clad materials.

Fabrication manual for clad steels is available by remitting $3.00 direct to Lukens Steel Co., Dept. CP, 599 Lukens Bldg., 1949 Gillen St., Coatesville, Pa. . . . or for more information check CP 7219 on handy form opposite last page.

Describes protective coatings line

Company's line of standard neoprene heavy-duty and extra-heavy-duty, styrene, and epoxy resin base coatings are described and their applications illustrated, in 14-page bulletin.

Bul No. 7-2 is available from The Atlas Mineral Products Co., Dept. CP, 26 Walnut St., Mertztown, Pa. Check CP 7220 opposite last page.

Design and construction of acid-proof trenches

As an aid to engineers designing trenches for carrying acids and corrosive liquids, single-page data sheet gives specifications, bill of materials, and graphical methods for determining width and slope of trench, knowing capacity desired.

Construction Plans No. 608 is issued by Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. When inquiring specify CP 7221 on handy form opposite last page.

Electronic timer self-compensating for varying line voltage

Bulletin of four pages describes electronic timer accurate to ±1% on varying line voltage. Six circuit diagrams are included. Chart shows per cent time deviation from 90 to 135 volts. Timer has eight-amp contacts, three time ranges covering 0.1 to 100 seconds, NEMA cover.

"T-2 Timer" is available from Ferrara Inc., Dept. CP, 8106 W. Nine Mile Road, Oak Park 37, Michigan. When inquiring specify CP 7222 on handy form opposite last page.

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Write Today for free Bulletin 270
Address: Dept. CP-555 Process Equipment Division

71E

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Akron 9, Ohio

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Write to these addresses for more information on conventions and exhibits listed on page 5 of this issue.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh 13, Pa., Mr. H. C. Ballman, Executive Secretary.

American Institute of Chemical Engineers, 25 W. 45th Street, New York, New York.

American Institute of Electrical Engineers, Magnetics Exhibit, 845 Ridge Ave., Pittsburgh 12, Pa., Mr. Richard Rimbach.

American Pharmaceutical Manufacturers Association, 608 Fifth Avenue, New York 20, N. Y.

American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

Chemical Market Research Association, c/o Jefferson Chemical Co., 260 Madison Ave., New York 16, New York, Mr. Robert Henderson.

Chemical Specialties Manufacturers Association, 50 E. 41st Street, New York, New York, Mr. H. W. Hamilton, Secretary.

IRE Materials Symposium, Fluorocarbon Products, Inc., Div. of United States Gasket Co., Camden 1, N. J., Mr. Merritt A. Rudner, Dir., Electronics Research.

Instrument Society of America, Exhibit Manager's Office, 3443 S. Hill Street, Los Angeles 7, California.

Michigan State College, School of Engineering, Engineering Symposium, Publicity Committee, East Lansing, Michigan, Mr. W. I. Kenerson, Chairman.

National Materials Handling Exposition, Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

Packaging Institute, 342 Madison Avenue, New York 17, N. Y.

Society of the Plastics Industry, 295 Madison Avenue, New York 17, N. Y.

Western Plant Maintenance Show, 759 Monadnock Building, San Francisco 5, California.

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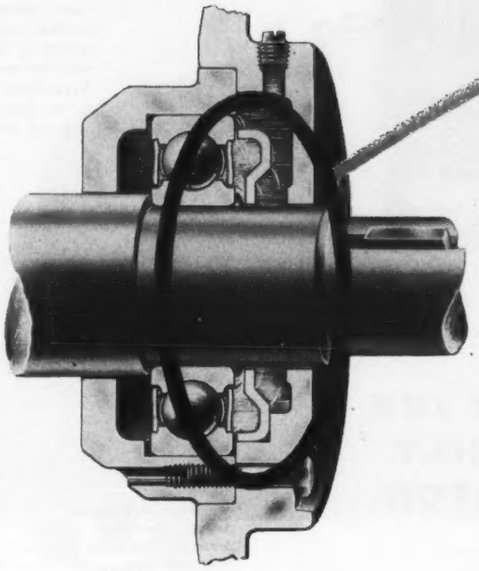

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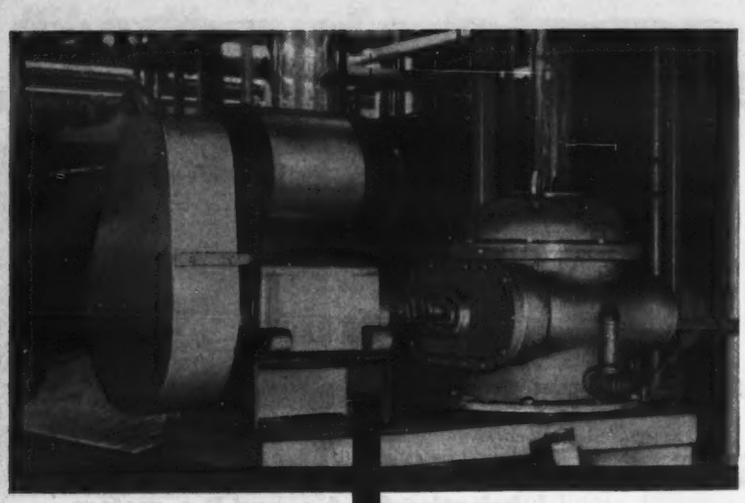

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Discussed in this issue — PROCESSES, EQUIPMENT *and* MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here—if you want more data you can write manufacturer direct . . . or turn to pages 2 and 3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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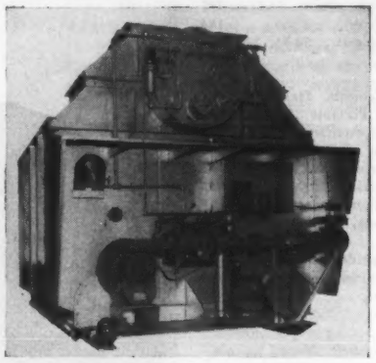
for accurately controlled high temperature at low pressure:

UNION | PACKAGED DOWTHERM VAPORIZERS



Piped, wired and entirely assembled before shipment, Union Type MH Packaged Dowtherm Vaporizers are built in capacities from 4,000,000 to 15,000,000 BTU/hr. for use with Dowtherm or other heat transfer media. Their compact, divided tube bank design assures uniform gas flow across the heating surface. With greater heating surface per BTU provided, fluid overheating is prevented. Designed for heating with oil, gas, waste heat or special fuels, MH Vaporizers are installed indoors or out—wherever high temperature, low pressure heat is required in the process industries.

Union also produces a complete line of process heating equipment in capacities from 50,000 to 30,000,000 BTU/hr.

For detailed information without obligation, write.

UNION IRON WORKS
1555 Cascade Street Erie, Pennsylvania

UNION

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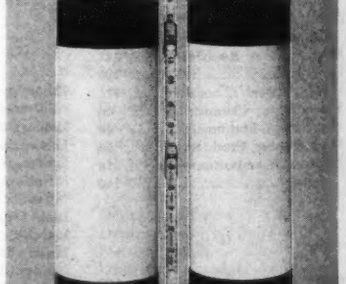
McDANEL

... A RELIABLE SOURCE FOR Special Ceramic Parts

Send us a sketch . . .
Let us study it

● Perhaps you've considered a high-strength, high-temperature ceramic for a certain part, but couldn't find a manufacturer to produce it. Special Ceramic Parts are our specialty! It might be pump cylinders (shown here), valve seals, flow chokes, pump plungers or gun nozzles. Maybe it's a part never made before. Send us a sketch of it. Special shape, special mix, special die or special body . . . McDanel can do! Investigate McDanel Special Ceramics soon!



Write for your McDANEL INDUSTRIAL CERAMIC CATALOG TODAY!

McDANEL Industrial PORCELAINS

McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNSYLVANIA

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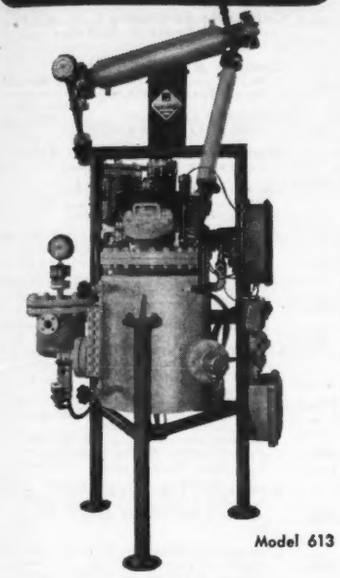
15 gallon capacity

p-k STANDARD PILOT PLANT



Model 613

Like other **p-k** pilot plants, this packaged unit combines maximum flexibility and accuracy with low cost. Its key elements of kettle, condenser, decanter, receiver and piping provide a complete and compact apparatus for general experimentation in the manufacture of resins and similar processes.

Design pressure for all vessels, jackets and piping is 150 PSIG and full vacuum. Internal contact surfaces are stainless steel, ground smooth.

KETTLE: Dowtherm electric heating jacket—internal cooling coil. Reactor designed for 650°F. Variable speed agitator.

CONDENSER: Removable core type. Water cooled shell.

DECANTER: Removable top head.

RECEIVER: 5 gallons capacity. Removable top head.

INSTRUMENTATION: Temperature recording controller and pressure indicator on reactor. Indicators for pressure, liquid level, temperature on reactor jacket. Other indicators on condenser, decanter, receiver. Flow indicator in condenser discharge piping.

Write today for further details on Model 613 and other *standard* **p-k** pilot plants. By checking **p-k** first, you can save original design cost and cut engineering and delivery time on the equipment you need.

The Patterson-Kelley Co., Inc., 750 Lackawanna Avenue, East Stroudsburg, Pa.

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Offices: New York, Chicago, Philadelphia, Boston and other principal cities

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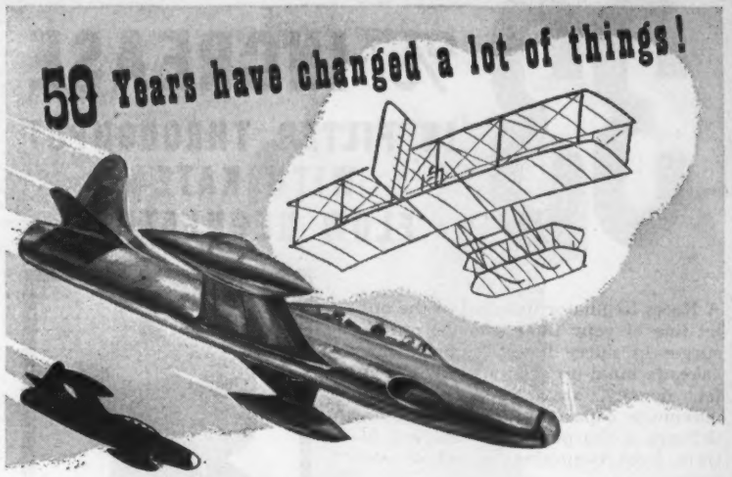

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DUST CONTROL

Man's accomplishments in all fields in the past 50 years are nothing short of spectacular. Compare the 12 second flight by the Wright Brothers in 1903 with the 3 hour and 46 minute non-stop transcontinental flight made March 9th, 1955. Striking progress in dust control equipment has also been made.

The DAY "AC" Dust Filter, made under DAY and Hersey patents, is the *modern* filter to match *modern* methods. It handles up to *five* times more dust laden air per square foot of cloth area than out-moded conventional type filters. Filter tubes are cleaned *automatically* and *continuously*. At the same time this modern DAY Filter requires one-third less plant space.

DAY "AC" FILTER RECOVERS 99.99+% and SAVES CHEMICAL PLANTS VALUABLE DOLLARS

The Chas. Pfizer and Co. Inc., is currently using eight DAY "AC" Dust Filters.

DAY Self-Adjusting Blow Rings assure perfect ring-to-cloth contact. These patented cleaning rings improve filtering effectiveness, lengthen filter tube life and provide increased savings from product recovery. Write toDAY for bulletin 528-R. It explains the DAY Dust Filter in detail.

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852 Third Avenue N. E., Minneapolis 13, Minnesota

IN CANADA: P. O. BOX 70Y, Fort William, Ontario
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DAY SINCE 1881

STOP AIR POLLUTION with **DAY** DUST CONTROL

When inquiring check CP 7231 opposite last page

33% INCREASE
IN FILTER THROUGHPUT WITH KATES FLOW REGULATORS

A Kates Regulator installed in the outlet line of your filter smooths out the surges in slurry flow . . . helps filter cakes to build up evenly and with perfect density. Your filter operates at maximum capacity all day long—and delivers a sharper, more brilliant filtrate from beginning to end of each cycle.

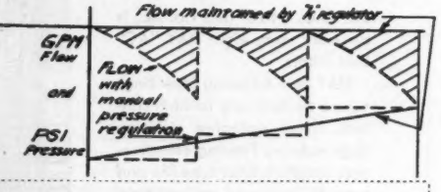
Economical Kates Regulators eliminate all need for repeated manual adjusting of control valves. Once the dial is set at the rate you require, the Kates Regulator holds filtrate flow at that rate, constantly—despite continually changing cake thickness.

Recycle rate can be set and held, independent of cake thickness. Same regulator does this job, too.

The Kates No. 4-SA regulator shown here is installed on a 360 sq. ft. filter made by Process Filters, Inc. Daily throughput of grape juice is 48,000 gallons. Without Kates Regulator, daily throughput of same liquid was approximately 36,000 gallons.

Tell us your filtration problem and let us suggest the way in which a Kates Regulator can help you.

Type SA Size	Flow rating in GPM of Water
1 SA	2 — 10
2 SA	4 — 20
4 SA	10 — 50
5 SA	20 — 100
6 SA	35 — 175
7 SA	50 — 275
8 SA	100 — 550



The W. A. **Kates** COMPANY
430 Waukegan Rd.
Deerfield, Illinois

Gentlemen:
Increasing filter throughput 33% sure interests me!

☐ Tell me how it's done.
☐ Please have a Field Man call soon.

Type of Product filtered_____
Name_____
Company_____
City_____ Zone_____ State_____

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Now- - - this dependable pump fits many more applications

In the past eight years the chemical industry throughout the world has seen LaBour Type G hang up record after record for uninterrupted service and low or non-existent cost for repair parts. Now this revolutionary packingless, self-priming centrifugal pump becomes even more useful because the new Type CG can handle flooded suction applications as well as the suction-lift conditions to which former Type G pumps were restricted.

Other advantages have been added, also, including closure of the dynamic seal to prevent escape of toxic gases, and the ability to flush the seal at will during normal operation.

Get the whole story in Bulletin G-1. Ask us to send your copy — today.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. • Elkhart, Indiana, U.S.A.

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SEE WHAT CO_2 CAN DO FOR YOU

NEW JOBS FOR CO_2

These are typical examples of CO_2 at work. Many other important CO_2 applications, covering all industry, are discussed in a booklet available from LIQUID CARBONIC — world's largest producer of CO_2.

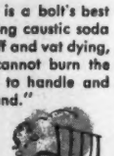
flavor saver

Bacteria breeding air is banished when foods are packaged in an atmosphere of CO_2 gas. 50% heavier than air, CO_2 gas effectively displaces this enemy of flavor and freshness. Cost? Amazingly low. Investigate.

fabric's friend

Of all weak acids, CO_2 is a bolt's best bet. As an aid in removing caustic soda after mercerizing, boil-off and vat dying, CO_2 has no equal. It cannot burn the cloth, is the easiest acid to handle and produces a superior "hand."

sponge specialist



CO_2 is extensively used in the manufacture of both plastic sponge and foam rubber. Two of CO_2's most important applications in these fields include use as a foaming agent and as a neutralizing acid.

next case... yours

There's practically no end to the important jobs that CO_2—combined with LIQUID savvy—is doing. Chances are this combination can come up with some surprising answers for you, too.

FREE BOOKLET!
—mail this coupon.

THE LIQUID CARBONIC CORPORATION
3124 South Kedzie Avenue, Chicago 23, Illinois

Send me my free "Applications Unlimited" booklet.

Name _____

Company _____

Position _____

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City _____ Zone _____ State _____

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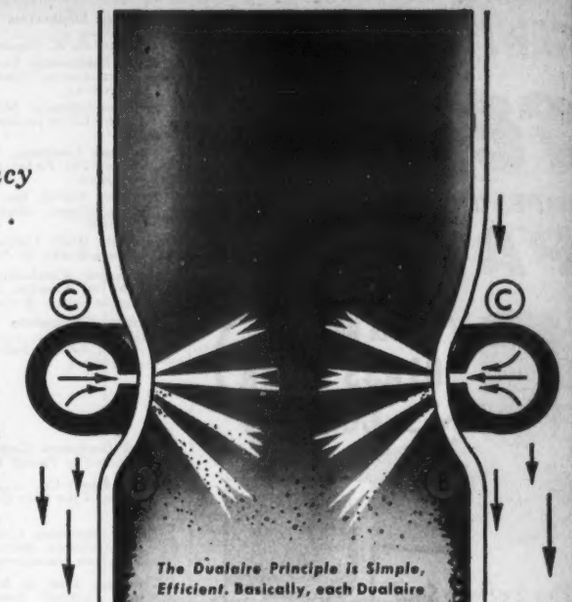

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☐	6840	Grooved-end Butterfly Valves
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☐	6854	Chart Recorder
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☐	6860	"Controlled-volume Pumps for Water Treating Systems"
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☐	6861b	Thermocouple Extension Wires
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☐	6868	Thermoregulator
☐	6869	Absorber Instrumentation
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☐	6875	Pyrometer
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☐	6878	Photoelectric Switch
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☐	6884d	Proximity Meter
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☐	6919	Plate Scale
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☐	6920b	Bin-level Indicator
☐	6921	Portable Belt Conveyor
☐	6922	Conveyor-elevator
☐	6923	Vibrating Feeder
☐	6924	Self-starting Vibrators
☐	6925	Palletizer
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☐	6927	Portable Drum Elevator
☐	6928	Liquid-level & Industrial Controls
☐	6929	Rotary Valve
☐	6930	Industrial Trucks
☐	6931	Concrete Silos & Storage Systems
☐	6932	Pulsating Panel Bin
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☐	6934	Granular Material Sizing Machinery
☐	6935	Checkweigher
☐	6936	Dolly
☐	6937	Electric Fork Truck
☐	6938	Acid-handling Pumps
☐	6939	Diaphragm Slurry Pump
☐	6940	Wire Cloth & Fabrication
☐	6941	Carboy Package
☐	6942	Rubber Inserts for Drums
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☐	6944	Multiwall Bag Printing
☐	6945	Self-opening Carton
☐	6946	Bag Filling Machine
☐	6947	Case Sealer

Be Sure To Give Your Address

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MAY, 1961

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☐	6948	Humidity Conditioning
☐	6949	Rotary Airlock (State Requirement)
☐	6950	Sleeve Valve for Multiwalls
☐	6951a	Pipe Markers
☐	6951b	Aisle Markers
☐	6951c	Numbers and Letters
☐	6952	Liquid Tank Gage
☐	6953	Plastic Containers
☐	6954	Stainless Pails
☐	6955	Celled Box
☐	6956	Bagging Scale
☐	6957	Lined Container
☐	6958a	Air Appliance (State Which)
☐	6958b	Industrial Filtration Equipment (State Which)
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☐	6958A	Snap-open Multiwall Bag
☐	6959	Dry Material Filling Machines
☐	6960	Heat Sealer for Plastic Film
☐	6961	Progressing-cavity Pump
☐	6962	Round Processor
☐	6963a	Dissolvers
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☐	6964	Impervious Graphite Heat Exchangers
☐	6965	Injection Molding Machine
☐	6966	Centrifugal Separator
☐	6967	Plate Filter Press
☐	6968	Flow Regulator
☐	6968A	Pressure-leaf Filter
☐	6969	Dual-type Demineralizer
☐	6970	Steel Fabrication
☐	6971a	Pilot Plant Homogenizer
☐	6971b	Colloid Mill
☐	6972	Spray Dryer
☐	6973	Change Can Mixer
☐	6974	Graphite Combustion Chambers
☐	6975	Plate Heat Exchanger
☐	6976	Ball Mill
☐	6977	Continuous Cooler
☐	6978	Plate-coils
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☐	6982	Quick-opening Doors
☐	6983	Dry Ice Crusher
☐	6984	Vibrating-screen Separators
☐	6985	Tablet Machine
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☐	6986c	Anti-biotic Dryers
☐	6986d	Kilns
☐	6986A	Vibrating Screens
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☐	6988	Pressurized Mechanical Seal
☐	6989	Dispersing Mixers
☐	6990	Liquid Strainers (State Which)
☐	6991	Electrical Enclosures
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☐	6993	Lever-sealed Valves
☐	6994	Flash-point Tester
☐	6995	Serrated Grating & Stair Treads
☐	6996	Safety Step Ladders
☐	6997	Flame-failure Alarm
☐	6998	Safety Clothing
☐	6999	Motor Starters

✓	Key	Description
☐	7000	Safety Apparel
☐	7001	Platform Hoist
☐	7002	Leak Detectors
☐	7003	Firefighting Suit
☐	7004a	Magnetic Ideas
☐	7004b	Magnetic Pulley
☐	7004c	Magnetic Drum
☐	7005	Power Roof Exhausters
☐	7006	Slide Valves
☐	7007	Explosion Extinguisher
☐	7008	Metal Grating
☐	7009	Frangible Discs
☐	7010	Leak Detector
☐	7011	Automatic Flash Tester
☐	7012	Substation Transformer
☐	7013a	Fire Protection Program
☐	7013b	Fire Equipment
☐	7014	Safety Goggles
☐	7015	Flexible Hose Coupler
☐	7016	Rubber-lined Exhausters
☐	7017	Viscometer
☐	7018	Colorimeter
☐	7019	Rotating Vacuum-type Evaporator
☐	7020	Combustion-tube Furnace
☐	7021	Gas Analyzer
☐	7022	Crusher
☐	7023	Portable Burner
☐	7024	Bottle Clamp
☐	7025	Industrial Thermometers
☐	7026	Surface Pyrometers
☐	7027	Muffle Furnace
☐	7028	Liquid Flow Measurement & Control
☐	7029	Laboratory Stirrer
☐	7030	Sediment Tester
☐	7031	H/C Tester
☐	7032	Bi-metal Thermometers
☐	7033	Drying Equipment
☐	7034	Plastic Labware
☐	7035	Manometer
☐	7036	Electric "Burners"
☐	7037	Lab Cooler
☐	7038	Reflex Gages
☐	7039	Filter Paper
☐	7040	Marking Pen
☐	7040A	Stirrer
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☐	7042	Porcelain Tower Packings
☐	7043	Manometer
☐	7044	Micro-bellows Pump
☐	7045	Lab Carts
☐	7046	Wide Field Microscopes
☐	7047	Manostat
☐	7048a	Rotary Drum Filters
☐	7048b	Horizontal Filters
☐	7049	Neoprene Filter Paper
☐	7050	Moyno Pumps
☐	7051	Corrosion-resistant Coatings
☐	7052	Pulverizing Mills
☐	7053	Plastic Fabrications
☐	7054	Water Softeners
☐	7055	Pneumatic-hydraulic Power Unit
☐	7056	Needle Valve
☐	7057	Refractory Concrete
☐	7058	Diaphragm Valve
☐	7059	Steam Traps
☐	7060	Cooling Towers
☐	7061	Sound-powered Telephone
☐	7062	Polyethylene Multiple Tube
☐	7063	Adhesive Bond Primer
☐	7064	Water Jet Eductors
☐	7065a	Vertical Pump

✓	Key	Description
☐	7065b	Horizontal Type A Pump
☐	7065c	Horizontal Type AS Pump
☐	7066	Tube Expander
☐	7067	Triple Electrode Spark Plug
☐	7068	Ventilator
☐	7069	Spray Nozzles
☐	7070	Centrifugal Pumps
☐	7071	Catalyst Spray Guns
☐	7072	Temperature Controllers
☐	7073	Direct-fired Air Heaters
☐	7074	Manhead
☐	7075	Automatic Samplers
☐	7076	Hot Spray Paint
☐	7077	Flexible Ball Joints
☐	7078	Air Clutch
☐	7079a	Steam Trap
☐	7079b	Steam Trap Book
☐	7080	Process Equipment Fabrication
☐	7081	Steel Flooring
☐	7082	Cement for Vinyls
☐	7083	Industrial Fans
☐	7084a	Stainless Solenoid Valves
☐	7084b	Brass Solenoid Valves
☐	7085	Vibration Control
☐	7086	Paint Stripper
☐	7087	Waste Treatment Systems
☐	7088	Spray Dryer
☐	7089	Compressed-air Conditioner
☐	7090	Mixed-bed Deionizers
☐	7091	Turbine-type Pump
☐	7092	Non-dryng Glazing Compounds
☐	7093	Porcelain Valves
☐	7094	Rotary Vacuum Pumps
☐	7095	Boiler Gasket Impregnant
☐	7096	Alloy Properties
☐	7097	Valves
☐	7098	Roof Coating
☐	7099	Speed Reducers
☐	7100	Cleaners
☐	7101	Mix-Muller
☐	7102	Wire Cloth
☐	7103	Epoxy Resin
☐	7103A	Motor-compressor
☐	7104	Teflon Mechanical Seal
☐	7105	Impact Mill (State Material)
☐	7106	Ion Exchanger
☐	7107	Open-tank Water Heater
☐	7108	Spacer Coupling
☐	7109	Dust Collection & Recovery
☐	7110	Duct Fans
☐	7111	Mobile Vacuum Pump
☐	7112	Cleaning with Chemicals
☐	7113	Reflex Gages
☐	7114	Flexible Heating Elements
☐	7115	Hose Couplings
☐	7116	Dryers
☐	7117	Heavy-duty Gear Pump
☐	7118	Moisture and Oil Separator
☐	7119	Foamed-in-place Resin (state which)
☐	7120	High-pressure Pumps
☐	7121	Piston Packing
☐	7122	Plastic-welding Electrode
☐	7123	Stainless Tube Fittings
☐	7124	Snap-on Pipe Insulation
☐	7125	Quick-seal Couplings
☐	7125A	Portable Pumper
☐	7126	Synchronous Motors
☐	7127	Rotary Joints
☐	7128	Dust Collectors
☐	7128A	Air Filter
☐	7129	Stainless Mechanical Tubing

✓	Key	Description
☐	7130a	Building Insulation
☐	7130b	Cold Storage Insulation
☐	7130c	Pipe Insulation
☐	7130d	Insulation for Tanks, other Equipment
☐	7130e	Cellular Glass Insulation
☐	7131	Explosion-proof Motors
☐	7132	Propane-burning Heat Tool
☐	7133	Air-powered Pumps
☐	7137	Check Valves
☐	7138	Process and Transfer Pumps
☐	7139	Pressure & Vacuum Filter
☐	7140	Vacuum Dryer
☐	7141	Acetone
☐	7142	Industrial Truck Leasing Plan
☐	7143	Heat Exchangers
☐	7144	Laminating Compounds
☐	7145	Pneumatic Transmitters
☐	7146	Rubber Lining
☐	7147	Industrial Fans
☐	7148	Stainless Tube and Pipe Fabrication
☐	7149	Concrete Floor Patch
☐	7150	Self-contained Boiler
☐	7151	Butterfly Valves
☐	7152	Polyethylene Closures
☐	7153	High-lift Fork Truck
☐	7154	Pipeline Mixers
☐	7155	Glassblowing
☐	7156	Metal Fabrication
☐	7157	Electric Heat
☐	7158	Scintillation Counters
☐	7159	Nickel Castings
☐	7160	Bronze Valves
☐	7161	Controlled-capacity Pumps
☐	7162	Pipe Unions
☐	7163	Maintenance Cleaning
☐	7164	Vinyl Butyral Resins
☐	7165	Filter Presses
☐	7166	Feedwater Controls
☐	7167	High-pressure Gages
☐	7168	Protective Coatings
☐	7170	Ovens
☐	7171	Nickel Alloy Castings
☐	7172	Pipe Fittings
☐	7173	Automatic Proportioning Systems
☐	7174	MoS_2 as Lubricant
☐	7175	Protective Coating
☐	7176	Tube Cleaning Equipment
☐	7177	Electric Trucks
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☐	7179	Plastisols
☐	7180	Temperature Controls
☐	7181a	Steam Traps
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☐	7181c	Strainers
☐	7182	Combustion Burners
☐	7183	Zinc Phosphate Coatings
☐	7184	Water Conditioning
☐	7185	Air-tube System
☐	7187	Motor-pump Unit (State Application)
☐	7188	Industrial Ventilating Fans
☐	7189a	Liquid-level Controls
☐	7189b	Ice-thickness Controls
☐	7189c	Non-conductive Liquids
☐	7189d	Standard Time Switches
☐	7189e	Cycle Repeating
☐	7189f	Program Clocks
☐	7189g	Time Delay Relays
☐	7189h	Auto Reset Timers
☐	7189i	Electronic Timers

✓	Key	Description
☐	7190	Centrifugal Pumps
☐	7191	Toxicology of Acrylonitrile
☐	7192	Odorant Injection System
☐	7193	Cadmium Lithopones
☐	7194a	Asphalt Coating
☐	7194b	Aluminum Paint
☐	7195	Hydraulic Closer
☐	7196	High-pressure Reciprocating Pumps
☐	7197	High-boiling Solvent
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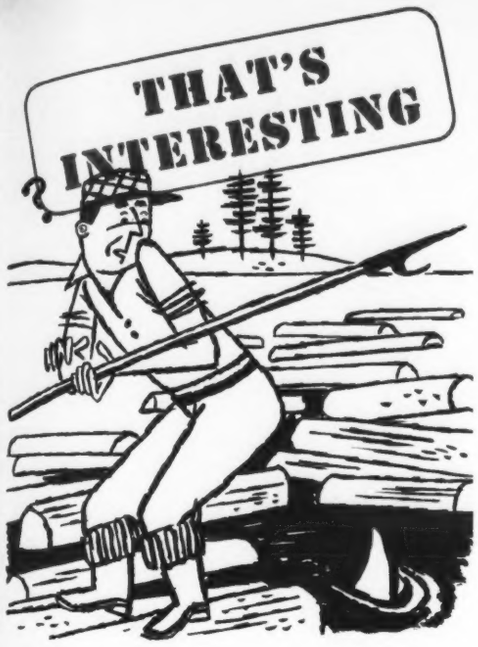

(*Continued from page 2*)

New pulp mill product?

In Coos Bay, Ore., a worker in the pulp mill's log-holding pond speared a passing fish with his pike pole, hung on as his catch led him across the floating logs toward shore, came up with a 15-foot shark which had to be removed from the pond with a log hoist.

"Mass of rust" restored after final voyage

Thousands of Chicagoans and visitors have seen the infamous German submarine U-505 recently laid to rest at the Windy City's Museum of Science and Industry. The exciting story of its capture by the US Navy in 1944 is well known. Physical condition of the undersea "killer", as it took its last voyage to Chicago, is less well known.

Ten years of weathering and salt water had taken their toll. The hull, gouged and battle scarred, was literally a "mass of rust". In places, the ¼" steel plates were eaten completely through. Rust-Oleum Corp. of Evanston, Ill., was called in to "dress up" the U-505 before it became a permanent outdoor display. The company applied a special primer coating to penetrate the rust and form a base (sand blasting might have disintegrated the hull since not much steel was left under the rust), while green and gray finish coatings were used for protection and beautifying. A touch of the unusual was added for Rust-Oleum since the sub was a "moving target". Priming and coating had to be done as the U-boat inched its way from Lake Michigan across the Outer Drive to the museum grounds.

Copper coupling is 4000 years old

Cheop's solar boat, being excavated by archeologists in Egypt, contains at least one coupling joint of copper. This discovery represents a hitherto unknown use of copper in Egypt's Fourth Dynasty — between 2680 and 2560 B.C.

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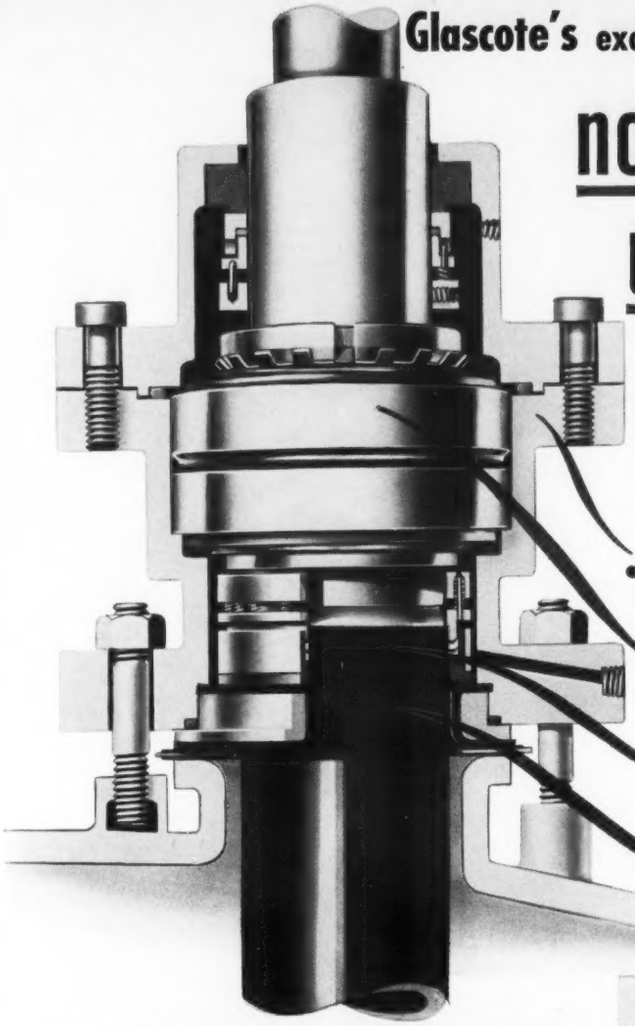

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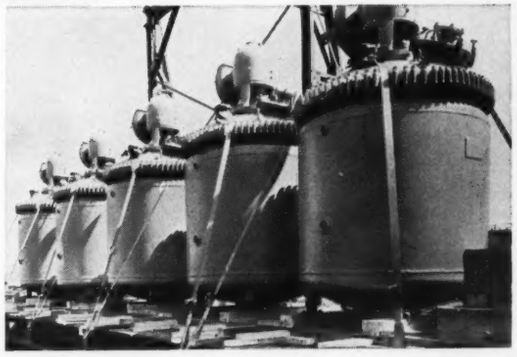
Ask the representative who calls on you for all the facts about Glascote products — reactors, receivers, condensers, evaporators, storage tanks and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith.



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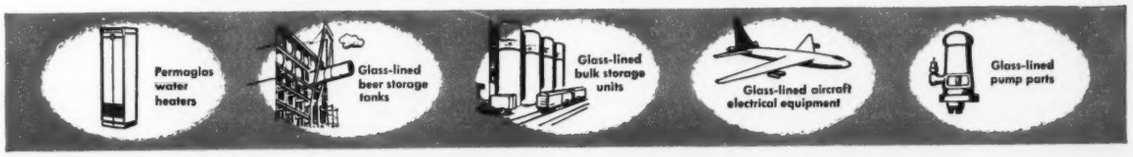

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